USER MANUAL for the

Tactical Atmospheric Modeling System/Real Time

(TAMS/RT)

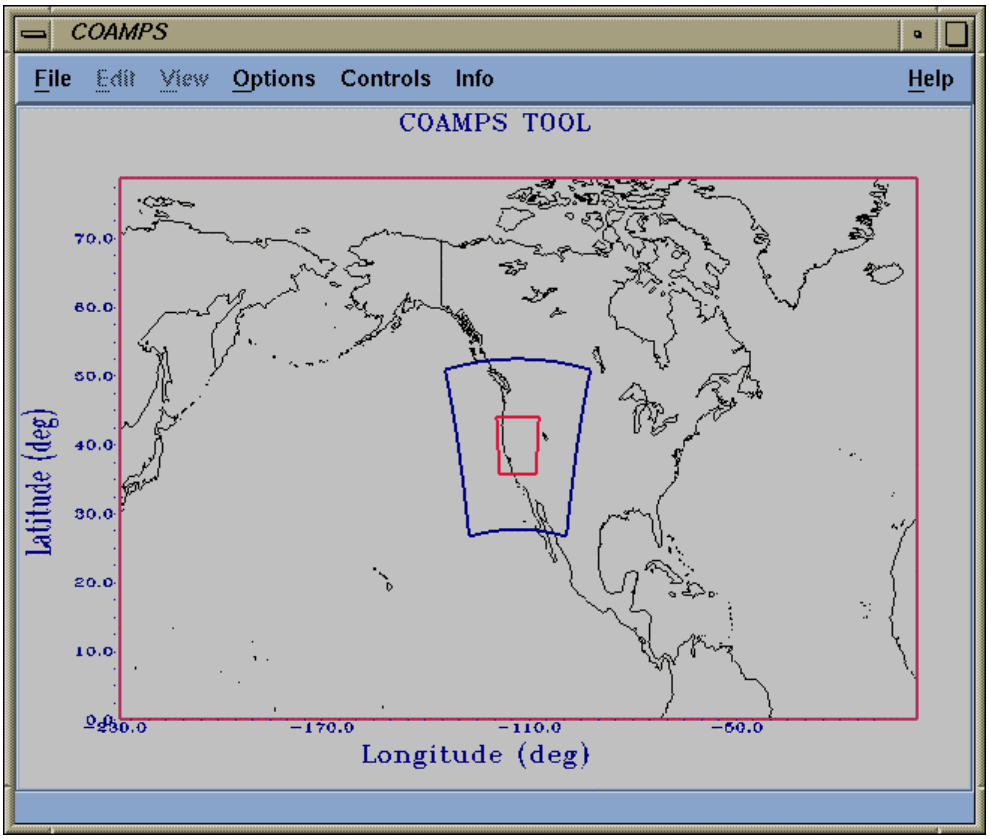

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Table of Contents

List of Figures

PART 1 – INTRODUCTION

The Tactical Atmospheric Modeling System/Real-Time (TAMS/RT) is a fully functional automated, portable atmospheric nowcast/forecast/data assimilation system. TAMS/RT allows you, the forward deployed user, to make use of the growing volume of perishable atmospheric data available on-scene by using either large-scale model or mesoscale model gridded data fields as a first guess and augmenting those data fields with observations, satellite data, etc. Currently, the data formats supported by TAMS/RT are the World Meteorological organization (WMO) standard Gridded Binary (GRIB) and Binary Universal Format (BUFR) formats. The core of TAMS/RT is built around the atmospheric component of the nonhydrostatic Coupled Ocean/Atmosphere Mesoscale Prediction System (COAMPS) developed at NRL and installed operationally at the Fleet Numerical Meteorology and Oceanography Center (FNMOC). The TAMS/RT graphical user interface built to control COAMPS allows you to both easily tailor numerical weather nowcasts and forecasts for areas of tactical interest and to set up customized output data sets, for example surface wind forecasts every 30 min.

Your TAMS/RT system is composed of three UNIX workstations connected to either the classified (SIPRNET) or unclassified (NIPRNET) internet network. The three workstations are:

1) The COAMPS computational server, a multiprocessor Silicon Graphics, Inc. (SGI) Origin 2000 server with the COAMPS software installed, including world-wide data bases of static surface parameters, such as 400 m resolution coastlines, 1 km resolution terrain height, 1° resolution albedo, land use, etc.;

2) The Tactical Environmental Data Server (TEDS) database server, an HP C200 server with the TEDS relational database management schema installed on top of the Informix product; and

3) A SGI O2 graphics console/workstation that provides the capability to extract gridded fields, satellite derived winds, and conventional observational data from TEDS, and visualize the data for evaluation and diagnostic purposes. In addition, the O2 workstation hosts a web server which provides the graphical products over the network. This workstation also hosts the graphical user interface (GUI) for COAMPS that allows you to easily set up, modify, and automatically execute a forecast.

The network is used primarily to transfer fields from the Navy Operational Global Atmospheric Prediction System (NOGAPS), run at FNMOC in Monterey, CA. NOGAPS provides the lateral boundary conditions and initial background fields for COAMPS and the NOGAPS fields are transmitted by FNMOC in the WMO standard GRIB format. The GRIB format files are decoded by TEDS software components, which also contains a set of Application Programming Interfaces (API) used to extract data out of the Informix database. In addition to decoding the NOGAPS fields, the TEDS component of TAMS/RT can also automatically decode, store, and quality control

observational data from both serial and network data feeds. Normally, the serial port on the HP server is connected to an output port on the CONTEL Meteorological Workstation (CMW). In the future, this data connection will be migrated to the Meteorological Integrated Data Display System (MIDDS).

The output data products (fields) from COAMPS are designed to support operational interests, for example range-dependent refractivity, which is accomplished by post processing the output data fields through application specific interfaces. The output data fields can also be transmitted by TAMS/RT to any node on the network using tools within TEDS to process the files into GRIB format and to FTP them to the proper IP address and directory. Currently, these data dissemination tools cannot be configured by the operational user; the configuration for the data dissemination programs must be done by NRL developers.

As shown schematically in Figure 1, the core capability of TAMS/RT allows your site to independently ingest local observations, satellite-derived observations, and boundary conditions from a central or regional center and maintain an organic data assimilation capability including automated quality control software, a multivariate optimum interpolation (MVOI) atmospheric analysis, the COAMPS Ocean Data Assimilation System (CODA), and the COAMPS model. These components are controlled by you through the GUI. Both the COAMPS model and the TEDS database APIs have the ability to calculate derived sensible weather parameters from the basic atmospheric state variables. TAMS/RT provides these “hooks” in order to support the further processing of environmental data for visualization, decision making, and as input to other codes such as Meteorology and Oceanography (METOC) Decision Aids (MDA) and Tactical Decision Aids (TDA). The “bridge” between the environmental and tactical communities is provided by the Navy Integrated Tactical Environmental Subsystem (NITES) which has its interface through the TEDS database.

A unique feature of TAMS/RT compared with other mesoscale modeling systems is the ability to operate in data assimilation mode – feeding observations into the COAMPS forecast cycle. In the mesoscale data assimilation scheme, the previous model forecast is used as a starting point and observed data is incorporated in order to initialize the next model forecast. This process is repeated every 12 hrs. When this cycle is used to regularly update just the local model forecast field using the analysis (without a subsequent forecast), this is called the TAMS/RT nowcast. This nowcast feature is designed to automatically maintain a database containing the best estimate of the current environmental conditions within the domain.

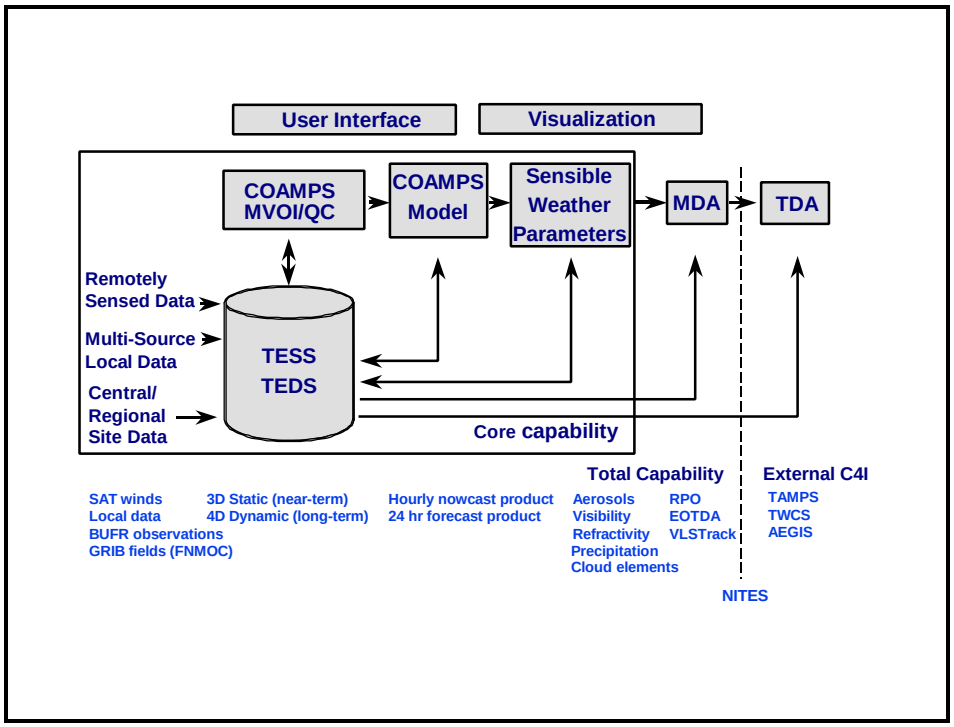


Figure 1. Schematic diagram of TAMS/RT components and internal data flow

For you, as a user, this basically means you can add value to the model outputs from Fleet Numerical Meteorology and Oceanography Center (FNMOC) and other modeling centers by running a fine-mesh tactical-scale model that incorporates additional data from observations. This allows you to supply mission planners and operators with finer-scale, more meaningful data for planning and decision aids.

HOW THIS MANUAL IS ORGANIZED

This manual shows you how to use TAMS/RT. It is divided into four main sections:

1. The introduction, which also contains some basic information about window-based user interfaces, navigating within windows, using the mouse, etc.

2. A "How Do I?" section that walks you step-by-step through common tasks involved in running TAMS/RT.

3. A User Interface section that describes each of the TAMS/RT windows in detail, with descriptions of each option and the usage.

4. A Developer's section describing how the user's environment, file system, and directory structure are configured.

MOUSE BASICS

A mouse is a tool used to move the cursor around the computer screen, make selections, and perform other actions. The Silicon Graphics computer that TAMS/RT runs on uses a 3-button mouse like the one shown below.

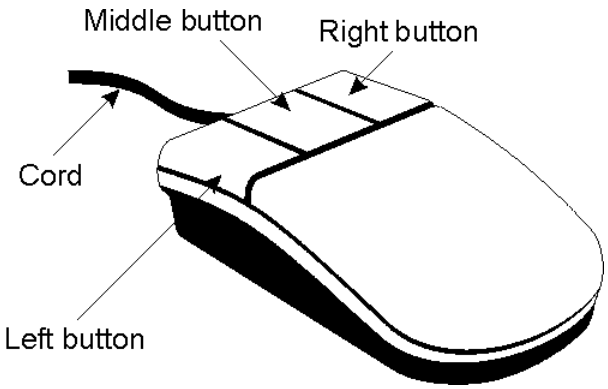


Figure 2. The Mouse

The mouse has a sensor on the underside that responds when the mouse is pushed across a surface. As the sensor responds, a signal is sent to the computer, which moves the cursor on the screen as the mouse is moved. Pressing one of the mouse buttons also sends a signal to the computer, which records the position of the cursor when the button was pressed and which button was pressed. Some basic mouse operations are:

Click — By convention, a **click** is a quick press and release of the left mouse button.

Right-Click — A quick press and release of the right mouse button.

Double-Click — Pressing and releasing the left mouse button twice in rapid succession.

Drag — To drag an object, position the cursor over the object, press and hold the specified mouse button (usually the left one unless otherwise specified), and move the mouse. When done dragging the object, release the mouse button. This technique is used to resize windows and to move objects around on the screen.

Within the TAMS/RT GUI, the mouse buttons take on different characteristics depending on the current function (e.g., translating or resizing a COAMPS forecast area). This guide will instruct you on the functionality of the buttons within the GUI.

KEYBOARD BASICS

You can also use the keyboard to navigate through many of the TAMS/RT functions.

Menu Navigation With the Keyboard

In windows with a menu bar, note that some menu bar items have an underlined letter. Pressing the **Alt** key and the key for the underlined letter will pull down that menu. For example, pressing **Alt** and **F** together (abbreviated **Alt-F**) opens the File menu. Once any menu is pulled down, pressing the left or right arrow keys switches between menus on the menu bar. Pressing the up and down arrow keys switches between items within the open menu. Pressing the **Enter** key activates the currently highlighted menu item.

Navigation Within Dialog Boxes

Within a dialog box, you can use the **Tab** key to move forward between fields and/or buttons. **Shift-Tab** moves in the opposite direction. When a button is highlighted, pressing the **Enter** key performs the button action ("presses" the button). When a radio button or check box is active, you can use the space bar to toggle its state.

WINDOW AND NAVIGATION BASICS

This section describes the parts of a window and how to use them together with the mouse. You can skip this section if you are already familiar with UNIX window systems.

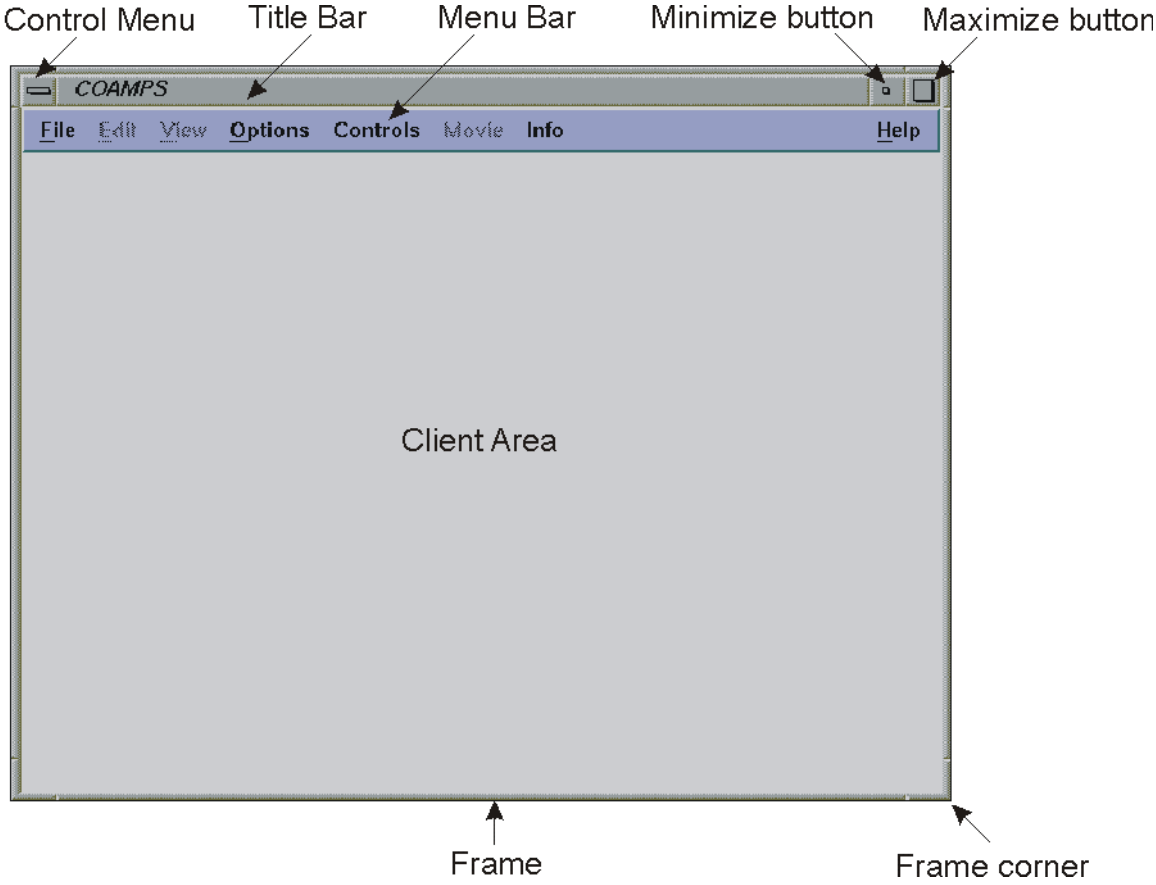


Figure 3. Parts of a Window

Frame Surrounds the entire window. If the window is not maximized (filling the entire screen) or minimized (shrunk to an icon), you can drag the frame to resize the window. Toresize the window, use the mouse to move the cursor over the part of the frame you want to move. The cursor will change to a double-ended arrow (horizontal for the side, vertical for the top). Press and hold the left mouse button while you move the mouse to pull on the frame piece. The frame will resize as you drag the mouse. When it's the size you want, let go of the mouse button.

Frame Corner Any one of the four frame corners can be used to resize the window in two directions at once. When you position the cursor

over a frame corner, the cursor changes to a 2-headed diagonal arrow. You can then drag the corner to resize the window.

Control Menu In the upper left corner of the window is the Control Menu, which provides options for the window (or the application that opened the window). If you click on the Control Menu icon, a menu will drop down – this menu lets you close the window, minimize it, maximize it (or Restore it if it is maximized), etc.

Title Bar The Title Bar contains the name of the window or the name of the application that created the window. The title bar has another function as well –the title bar can be dragged to move the whole window. To do this, just position the cursor in the title bar, press and hold the left mouse button, and move the mouse to move the window. When finished, release the mouse button.

Minimize Button This button is used to *minimize* the window; that is, to shrink the window to an icon on the screen. This is a convenient way to make more space on screen if you have multiple windows open. To restore a minimized window, just double-click on its icon.

Maximize Button The Maximize Button is used to make the window fill the whole screen. When a window is maximized, it can no longer be resized by pulling on the frame, and the Maximize Button changes to a Restore Button

Restore Button When a window has been maximized, the Maximize Button becomes a Restore Button, which allows you to return the window to its former size (before it was maximized). After you have restored the window, you can again resize it by dragging the frame.

Menu Bar The Menu Bar contains the menus that apply to the window or the application that created the window. Notice that some of the items in the menu bar in Figure 2 are "grayed out" – this means they are not active. The active items are shown in black. Inactive items may become active based on selections made in other menus or elsewhere in the menu.

By clicking on an active item in the menu bar (or by holding the Alt key and pressing the letter key of the letter underlined in the menu title) you "pull down" a menu. You can then use the mouse to select an item in the menu (the selected item will be highlighted) and click the left mouse button to select it. In some cases, this will perform an action immediately. In other cases, it will open another menu, or open a dialog box, which is another window that lets you respond to questions or enter inputs. One particularly important item on the menu bar is the **Help** menu, which provides you with

help specifically related to the current window. An addition feature of the pull down menus is that you can left mouse click on the dashed line near the top and they will “tear off” so you can place them anywhere convenient on the screen.

Client Area This is the main graphical "window" that is controlled by the application and by your inputs.

PART 2 –HOW DO I?

This section gives you step-by-step instructions describing how to perform common tasks in TAMS/RT.

HOW DO I LOG IN FOR TRAINING?

TAMS/RT is set up with five very important user accounts that you should be aware of. The first account is the “tams” user account. This account was created for the operational user and computer processes initiated by the “tams” user have priority on the system. The “tams” user also has access to the large file systems for storing COAMPS output data fields. To log in as the “tams” user, type “tams” (all lower case and no quotes) in the “Login name” entry on the screen. Type the password into the “Password” entry. The password can be recorded here in pencil and should be changed every six months. Good passwords are eight characters long and contain a mix of alphanumeric and non-alphanumeric characters. (Do not use the @, *, /, or ? symbols which are reserved in UNIX.) Also, the UNIX operating system is case sensitive so be aware.

Login name: tams

Password:_____

Two accounts have been set up for training purposes. The training accounts are named “guest-1” and “guest-2” and were created so that processes started on the system can be easily killed without interfering with the operational (“tams”) user’s jobs. To kill the COAMPS training jobs, open a UNIX shell window by clicking on the “Desktop” option in the SGI “Treasurechest” menu, usually in the upper left hand side of the screen, and then clicking on “UNIX Shell”. With the mouse pointer within the UNIX shell window (the window border will change color to show that the focus is in that window), type “coamps_kill” (lower case, no quotes) and hit return. This action will remove all the active COAMPS processes on the SGI server that were initiated during the training. No operational jobs initiated by the “tams” user will be affected.

Login name: guest-1

Password: xbw200sl

Login name: guest-2

Password: xbw200sl

Another important account to be familiar with is the “root” account which is provided for the system administrator. The “root” user has full privileges on the machine and is the only user that can perform many administrative duties (add accounts, etc.); this is the person to see when you forget your password or the system hangs up. For reference, record the name and phone number of the system administrator below:

TAMS/RT System Administrator_____

Phone number_____

The last account you need to know about is the "guest" account. This account is not for the TAMS/RT user or for training. The "guest" account is used by the UNIX operating system internally when communicating from computer to computer. This account should not be accessed by typical users and it should not be deleted nor locked by the system administrator.

HOW DO I LOG OUT?

To log out from the SGI console, hold down the right mouse button anywhere on the background or desktop portion of the screen. A pop up menu will appear only while the button is depressed. Scroll down the list to highlight the "Log out" entry and release the mouse button.. Confirm your desire to log out at the subsequent dialog box.

HOW DO I SET UP A COAMPS RUN?

When you start TAMS/RT, it opens two windows: a Main Control Panel and a COAMPS Map window. The Main Control Panel is the gateway to other Control Panels that let you control all aspects of the COAMPS model run. Two of these Control Panels (Map Options and Advanced Map Options) interact with the Map Window – that is, actions you perform in one window affect the options displayed in the other. If you use the cursor to place, move, or reshape an area in the map window, the results are displayed in the Map Options and Advanced Map Options windows; likewise, inputs made in these windows affect the area displayed in the Map Window.

If you accidentally close the Main Control Panel, it can be reopened from the **Controls** menu of the Map Window menu bar. The other major Control Panels may also be opened from this menu.

The TAMS/RT Main Control Panel, shown below, is set up to guide you through the steps required to set up a COAMPS model run. The red arrows indicate the steps to follow. Just click the button beside each red arrow to perform that part of the setup. As you finish each step, the red arrow will turn to a green checkmark, indicating the completion of the step. The steps are outlined in this section . More detailed descriptions of each of the Control Panels are provided in Part 3.

The "Vertical Grid" Control panel has been temporarily disabled. All COAMPS jobs will use the default 30 level vertical coordinate system and no user input is required.

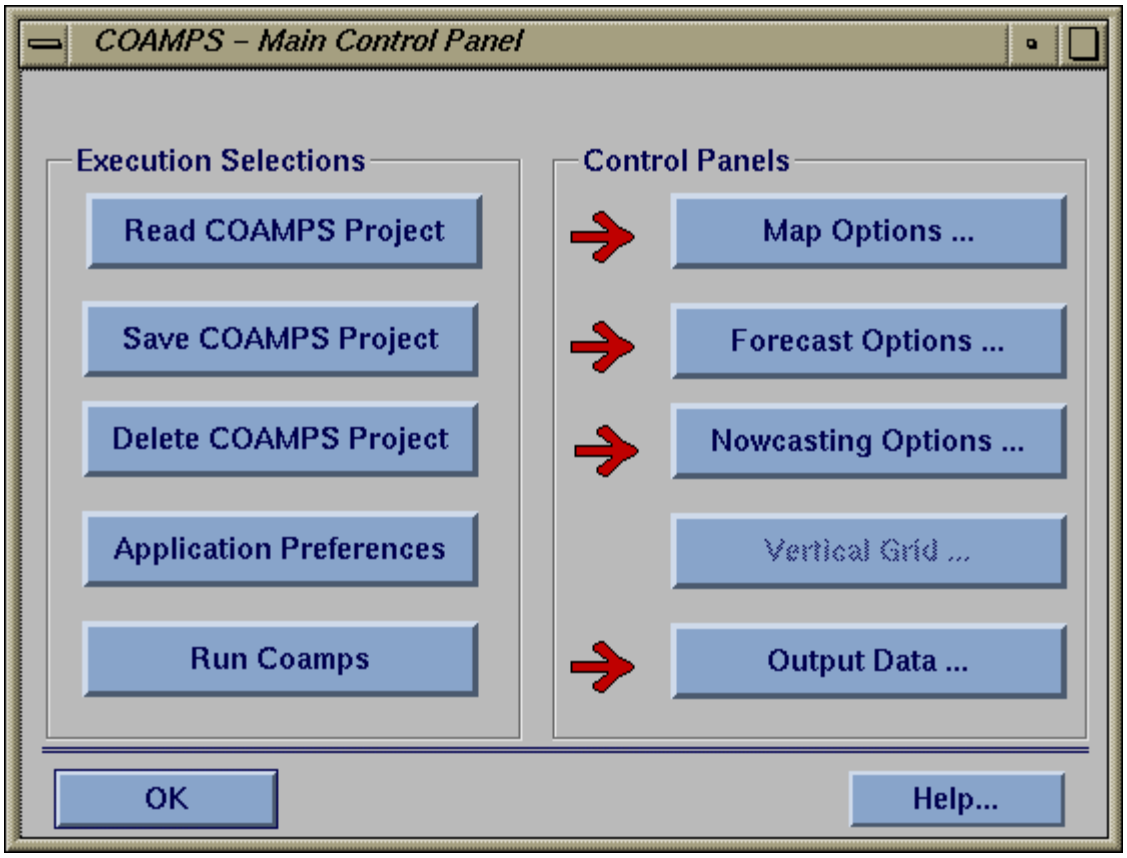


Figure 4. The TAMS/RT Main Control Panel

The steps to set up a COAMPS model run are:

1. **Set the Map Options**. Here you define the map projection, how many levels of grid nesting you require (more about nesting in the section on Map Options), the grid spacing for each nest, the center location for each grid, and other map-related options.

2. **Set the Forecast Options**. Under Forecast Options selections for forecasting intervals and how often to run the forecasts for each grid in the nes are determined

3. **Set the Nowcasting Options.** The Nowcasting Options area lets you select the start and end times for the nowcasting portion of a run, how often the nowcast is performed during the run, and how long after each base time the nowcast run will be started. There is also an option available to set a time delay to allow receipt of observation data).

4. **Set the Vertical Grid Options**. COAMPS uses a sigma-z, terrain following vertical coordinate. The Vertical Grid Control Panel lets you set the number of vertical levels used in the forecast and the thickness in meters of each grid level. The "Vertical Grid" Control panel has been temporarily disabled and no user input is required.

5. **Set the Output Data Options**. The Output Control Panel lets you set, for each grid in the nest, the parameters which will be output during the forecast and the levels at which parameters will be output.

6. **Run the COAMPS Model**. Once a run has been set up in Steps 1 through 5, you can run the COAMPS model to produce the specified outputs.

In the sections that follow, we'll discuss each of these steps in more detail.

HOW DO I SET THE MAP OPTIONS?

COAMPS uses a horizontally nested grid system – an outer, level 1 grid with progressively finer grids inside The inner (levels 2 – 4) grids must be fully contained within the next, or parent ,outer grid, but need not be centered within it. TAMS/RT allows you to forecast on up to four levels of grids. This section shows you how to use the Map Options Control Panel to set up the forecast grids.

One of the powerful features of the COAMPS model is the ability to let the high resolution terrain interact with or influence the local atmospheric flows that are set up by the larger-scale synoptic situation. Thus, when setting up the grid map for each nest it is very important to include within the grid the primary topographic features that influence the local conditions. For best results, these topographic features should be enclosed within the grid and adequately resolved at the scale of the grid resolution at which you choose to run COAMPS.

To open the Map Options Control Panel, click the **Map Options…** button on the Main Control Panel. The Map Options Control Panel, shown on the next page, will then open.

At the top of the Map Options Control Panel is a selector for the map projection. Click on the selector button to pull down a menu of projections. At this time, the available options are Lambert Conformal (the default), Mercator, and Spherical. These options specify the projection in which the COAMPS computations will take place and data will be output. Note that if you change the projection, the area depictions shown in the map window will change accordingly.

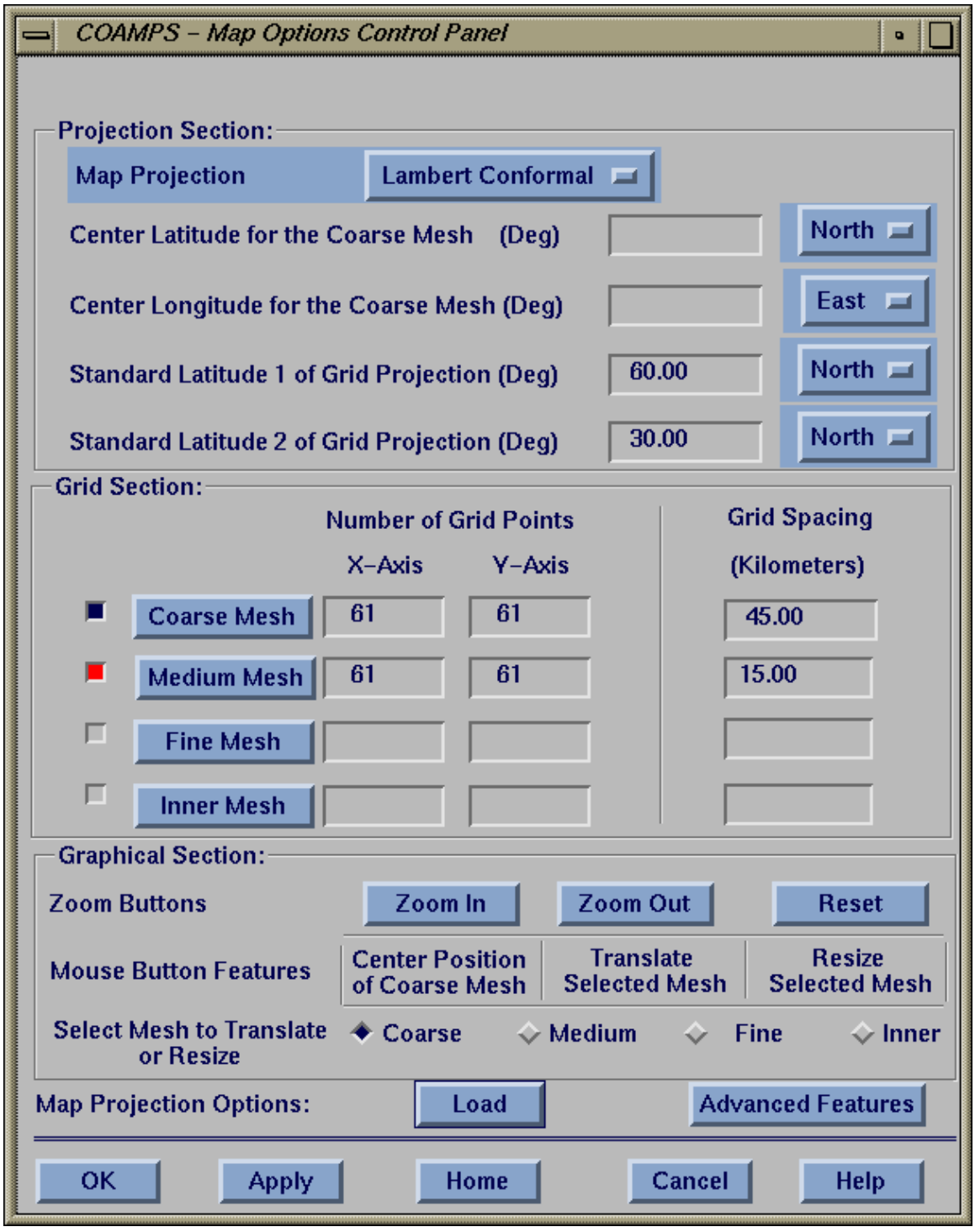


Figure 5. The Map Options Control Panel

Below the map projection selector are entry boxes to enter the center latitude and longitude of the coarse mesh (the outer level 1 grid), and selectors for the hemisphere values. You can change the latitude and longitude values by just typing new numbers in the boxes. Click on a hemisphere selector to pull down the applicable menu (North-

South or East-West). Note that if you change the center location, the depictions in the map window will change accordingly. You may also use the left mouse button and click within the graphical window an approximate position for the center latitude and longitude. The fields will be updated with the positions. You can also change the position of the coarse mesh in the map window using the left mouse button, and the center location in the Map Options control panel will change accordingly.

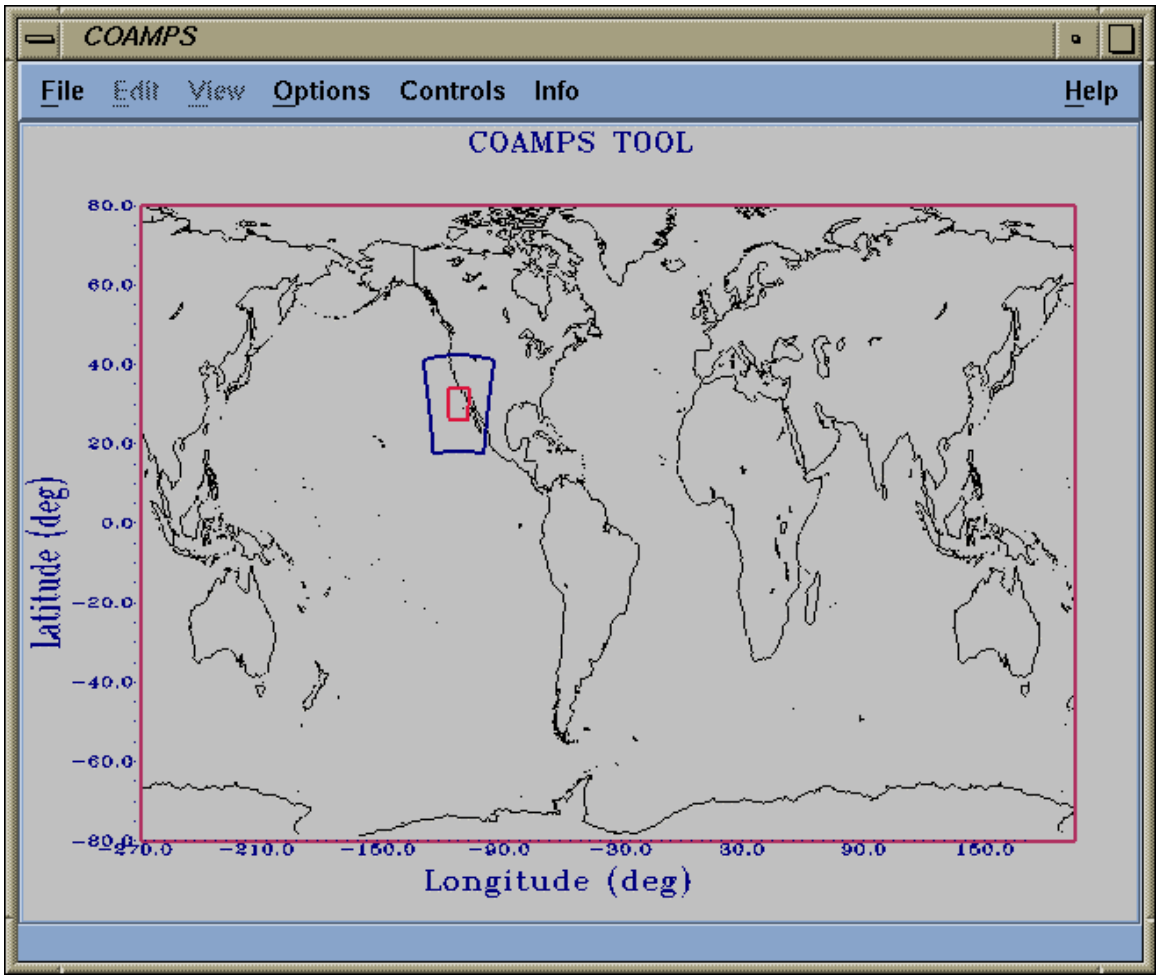


Figure 6. The COAMPS Map Window

Below the center latitude/longitude entries are entry boxes for the standard latitude(s) for the projection. Which ones of these are active, if any, depends upon the map projection selected. The default values are fine for most northern hemisphere mid-latitude cases. Changes to the default values should be coordinated with the developers at NRL whose email address and phone number are listed in the front of this manual.

In the middle of the Map Options Control Panel are the settings for the grid nests. By default, an outer (Coarse) grid and one inner (Medium Mesh) grid are turned on with default grid spacings. To turn on another nesting level, click the check box or the mesh label for the desired mesh. To turn off a mesh just reselect the number of meshes desired.

The Grid Section also has entry boxes to let you set the number of grid points for each grid in the North-South and East-West directions. The number you enter must be a multiple of 3 + 1 (4, 7, 10, 13, 16, 19, 22, etc.) with 37 the minimum number or grid points. You can also type in the grid spacing in kilometers for each nested level (you'll get an error message if your entries result in an inner grid that's bigger than the next outer grid).

The computing capacity of the computer you are running COAMPS on was chosen to be able to run three 36 hr forecast areas per watch with the default values. Using larger grids, higher resolutions, and longer forecast times will increase the running time of COAMPS; in fact, you can create a forecast domain so complex that the computer cannot even keep up with real time or you may exceed the size of the physical memory. As you'll find out later, when you go to actually run the job, a feedback window will appear with an estimate of the running time for the forecast. At that point you may have to come back to this control panel to reconfigure your domain to run in a reasonable amount of time.

You've already found that you can reposition the grid outline using the left mouse button to move the center position of the coarse grid. The **Graphical Section** of the Map Options Control Panel allows you to do other things in the map window. The **Zoom In** button allows you to zoom in on a smaller area of the map display in the center of the coarse mesh and see more detail. The **Zoom Out** buttons does just the opposite – it moves your point of view farther away from the map so that you see more area but less detail. The **Restore** button returns the map to its original configuration.

In the row marked "Select Mesh to Translate or Resize" are a set of radio buttons. Only one of the buttons in the set can be selected at a time – if you click on a button that isn't selected , the one that is selected will turn on wih previous selection turning off. The button that is pushed selects the grid mesh which will be affected by any mouse translation or resize. The row marked "Mouse Button Features" defines the mouse button usage for the selected mesh using the left, middle, and right mouse buttons.

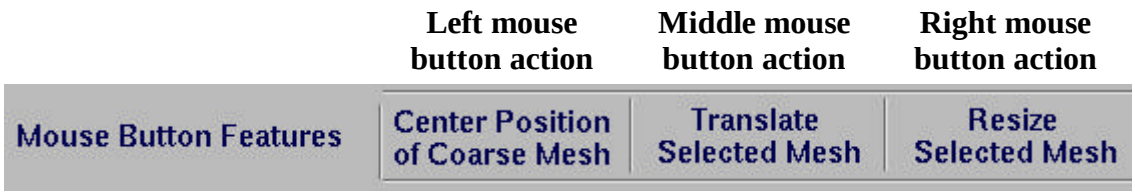


Figure 7. Mouse Button Features in Map Options Control Panel

Repositioning with the left mouse button always adjusts the center position of the coarse mesh. You can drag in the map window with the middle mouse button to translate the selected mesh (move it North-South or East-West). Dragging with the right mouse button will resize the selected mesh.

In the Map Projection Options section, the **Load** button may be used to load a previously defined set of map options. It is sometimes easier to do this than to start from scratch.

The **Advanced Features** button brings up the Map Projection Advanced Features dialog that allows you to toggle the behavior of the inner grids so that they are not centered within the outer grid. This panel is shown below.

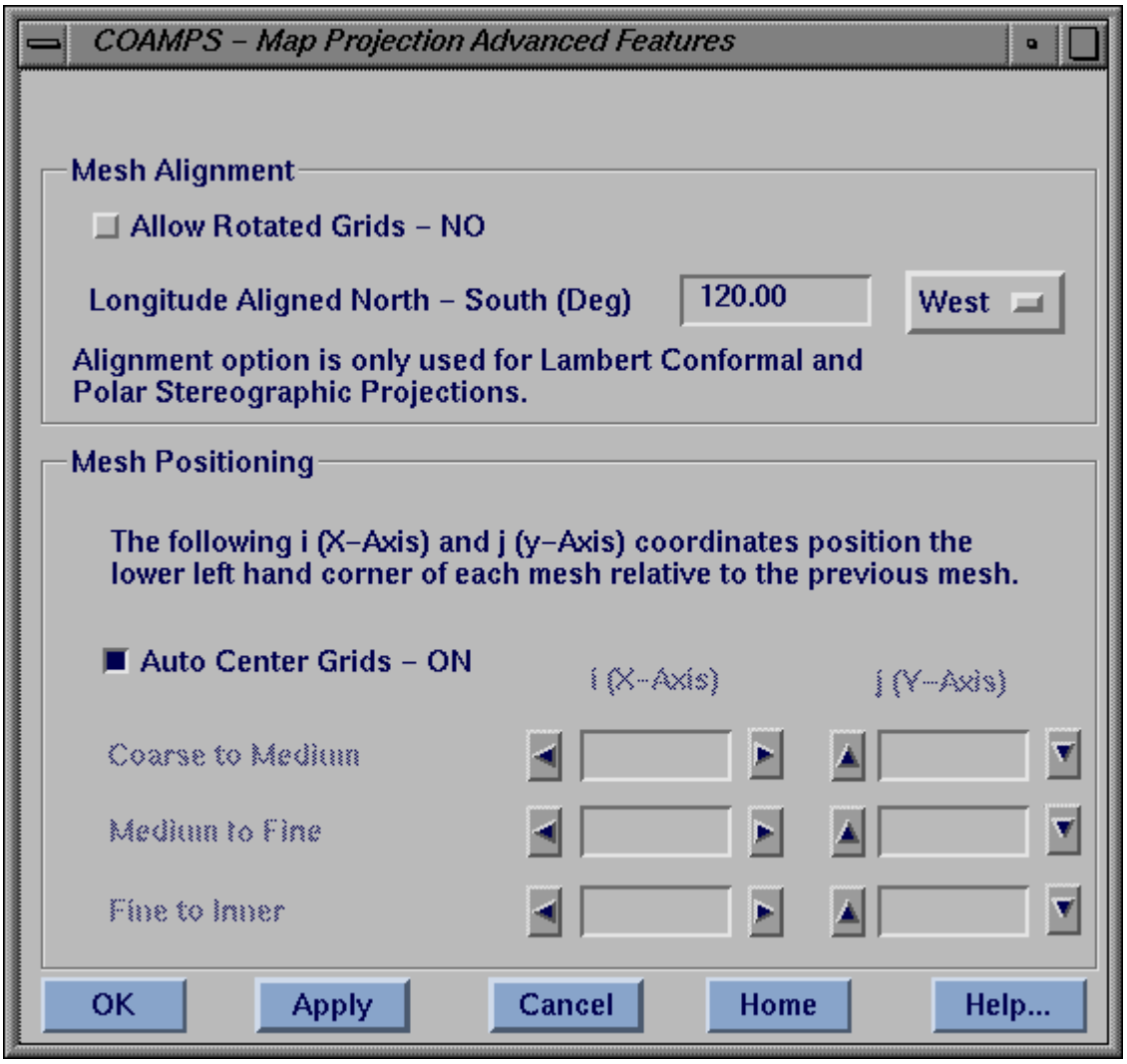


Figure 8. Map Projection Advanced Features Dialog

By default, the **Auto Center Grids** check box is checked, meaning that each inner grid is automatically centered within the next outer grid. To change this, click on the check box so that it is unchecked, then use the arrows in the boxes below to specify how far to move the center of each grid relative to the next outer grid in the X and Y directions. The distances are in grid points. You can also move the grids off-center by unchecking **Auto Center Grids** and using the center and right mouse button features in the map window. You will not be allowed to move an inner grid to the point where one of its boundaries is outside the blend zone with the next outer grid.

The **Allow Rotated Grids** toggle box lets you rotate a Lambert Conformal grid away from the reference longitude. In the Lambert Conformal map projection, the reference

longitude is defined as the longitude line on the map that extends perfectly vertical (or north-south). The entry box specifies the longitude used to reference the Lambert Conformal grid.

Use the **Apply** button to see the effects of your changes in the map window. The **OK** button is used to accept your changes, close the Map Projection Advanced Options dialog, and return to the Map Options Control Panel. The **Cancel** button is used to proceed without making any changes, and the **Home** button resets all values to their defaults.

In the Map Options Control Panel, use the **Apply** button to see the effects of your changes in the map window. The **OK** button is used to accept your changes, close the Map Options Control Panel, and proceed. The **Cancel** button is used to proceed without making any changes, and the **Home** button resets all values to their defaults.

When you return to the Main Control Panel after successfully setting the Map Options, the red arrow next to Map Options will have turned to a green check, as shown below.

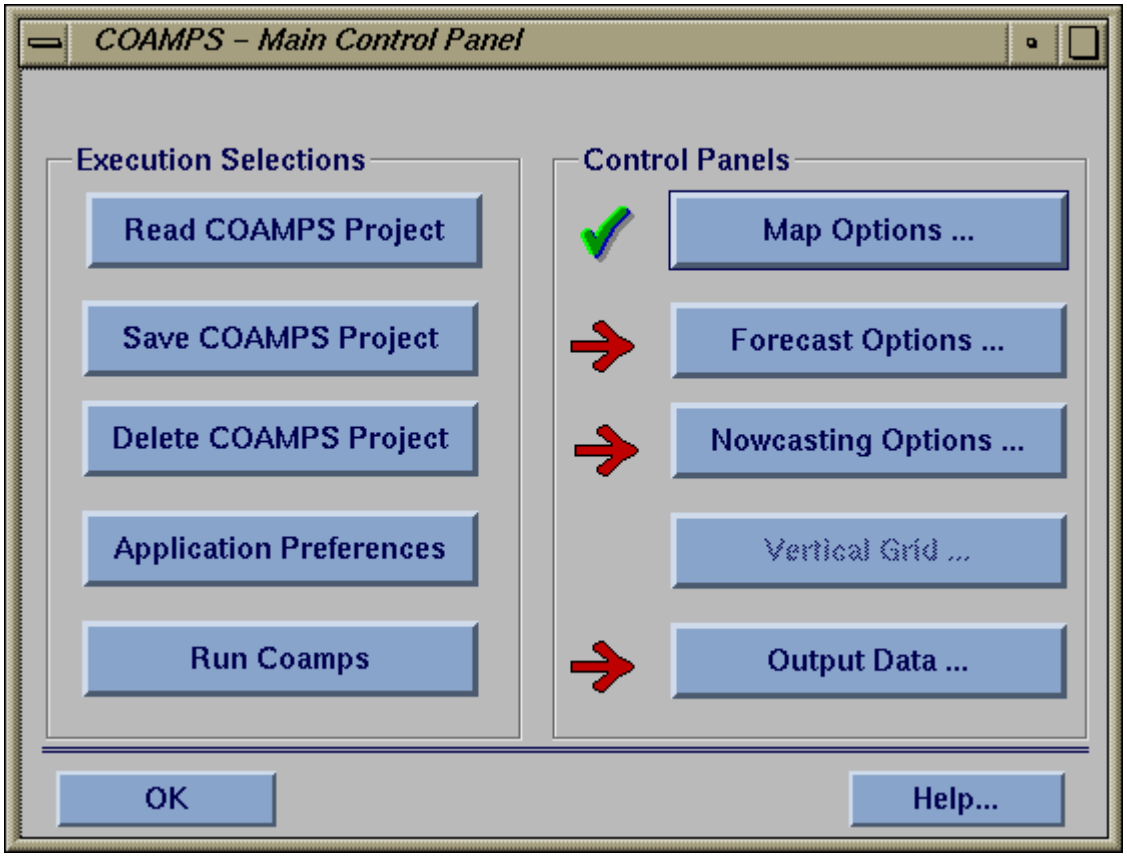


Figure 9. Main Control Panel After Completing Map Options Setup

HOW DO I SET THE FORECAST OPTIONS?

Clicking on the **Forecast Options…** button on the Main Control Panel opens the Forecast Options Control Panel shown below.

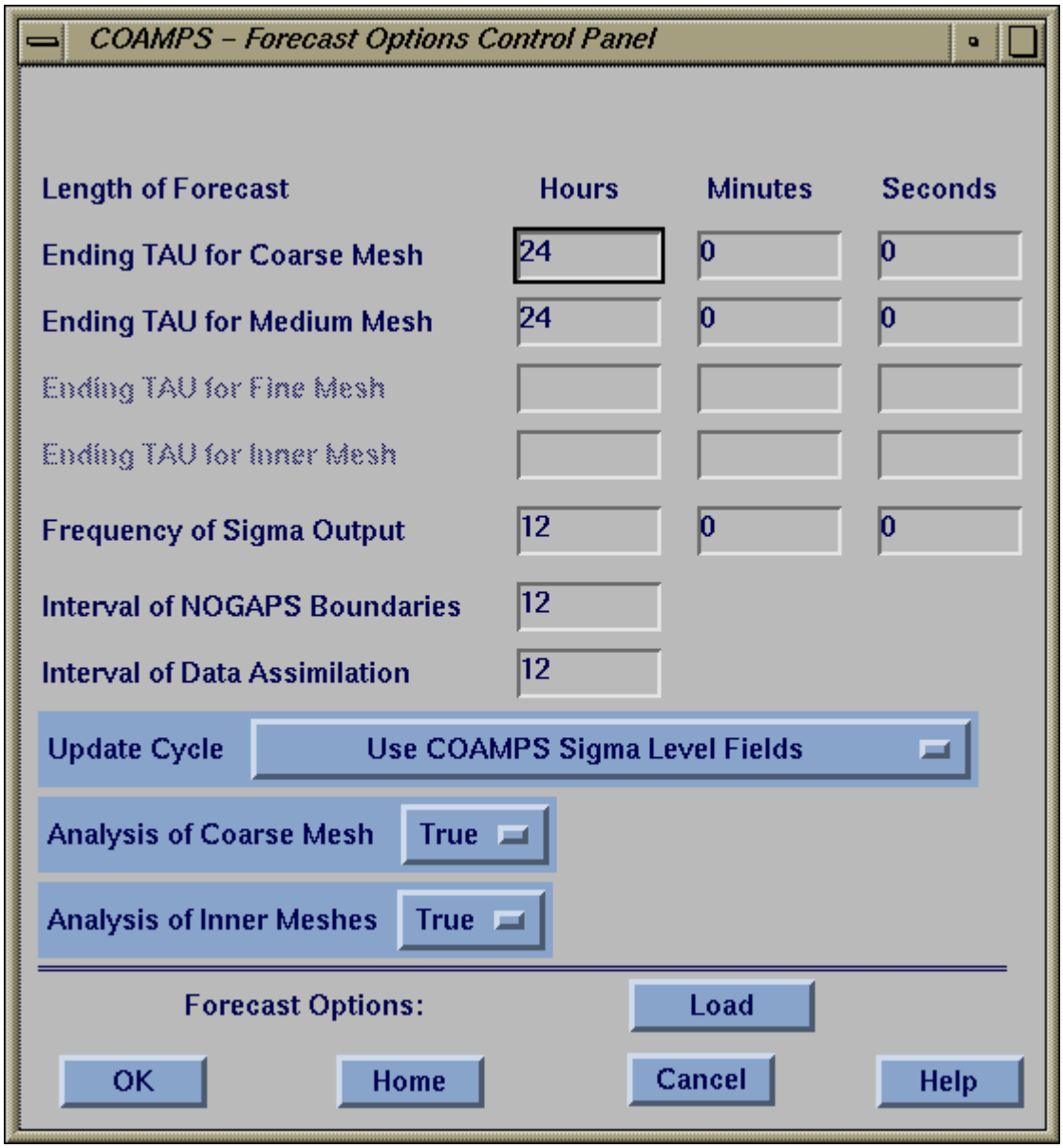


Figure 10. Forecast Options Control Panel

This panel allows you to set the length of the forecast period for each mesh (the default is 24 hours for each mesh specified). The TAU indicates the length of time after the analysis time for which forecasts will be run. Just type new figures in the boxes to change the length of the forecast .Note that the boxes for meshes not specified in the Map Options are not active You must have adequate lateral boundary conditions to support

the length of your desired forecast. The GUI will not let you over-specify the length of the forecast.

The **Frequency of Sigma Output** input boxes control the frequency at which data from the COAMPS internal computational grid (uninterpolated sigma level data) will be output.. Currently, sigma level data is used for developing animations of the model output in a 3-dimensional visualization and to support running other applications that require the highest level of fidelity of the gridded data sets. The default is every 12 hours, however, every hour may be required for smooth animations. \

The **Interval of NOGAPS Boundaries** and **Interval of Data Assimilation** boxes disabled, or "grayed out" below control the interval at which NOGAPS boundary condition fields will be ingested, and the interval at which observation data will be assimilated into the model. These values are not normally changed by the user.

The **Update Cycle** selector controls which fields are used for the "first guess", NOGAPS or COAMPS sigma level fields from a prior run. Because of the redundancy designed into COAMPS, leaving the value set at the default (COAMPS Sigma Level Fields) will work every time.

The **Analysis of Coarse Mesh** and **Analysis of Inner Meshes** selectors below this allow you to specify whether the coarse outer and/or inner meshes should be analyzed before the forecast model run. – You can make either or both True to analyze all meshes. The default is to analyze all meshes.

The buttons at the bottom function like those in the Map Options Control Panel.

When you have finished setting the Forecast Options and returned to the Main Control Panel, the red arrow next to Forecast Options will have changed to a green check as shown below.

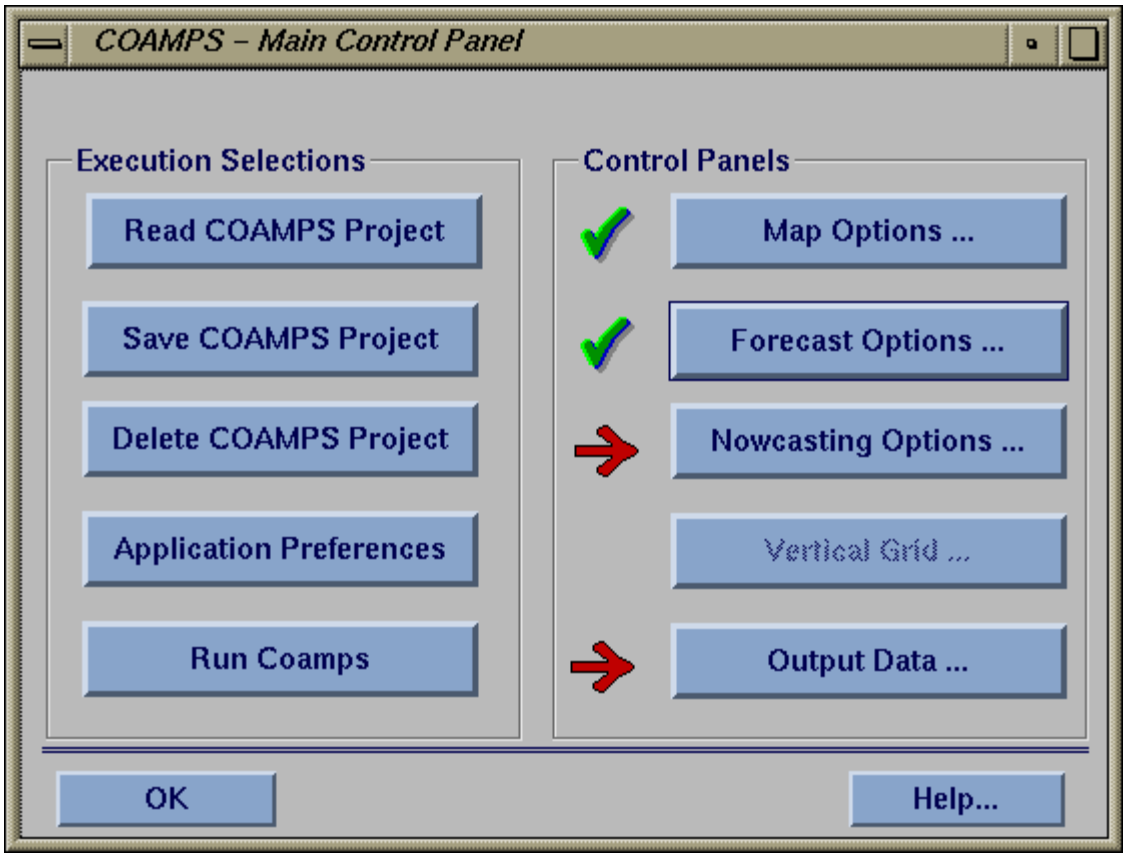


Figure 11. Main Control Panel After Completing Forecast Options Setup

HOW DO I SET THE NOWCASTING OPTIONS?

A unique feature of TAMS/RT compared with other mesoscale modeling systems is the ability to perform data assimilation. In the mesoscale data assimilation scheme, the previous model forecast is used as a starting point and observed data is incorporated in order to initialize the next model forecast. This process is repeated every 12 hrs. When this cycle is used in a batch mode to regularly update just the local model forecast fields using the MVOI analysis (without a subsequent forecast), this is called the TAMS/RT nowcast. This nowcast feature is designed to automatically maintain a database containing the best estimate of the current environmental conditions within the domain.

Clicking on the **Nowcasting Options…** button on the Main Control Panel opens the Nowcast Control Panel shown below.

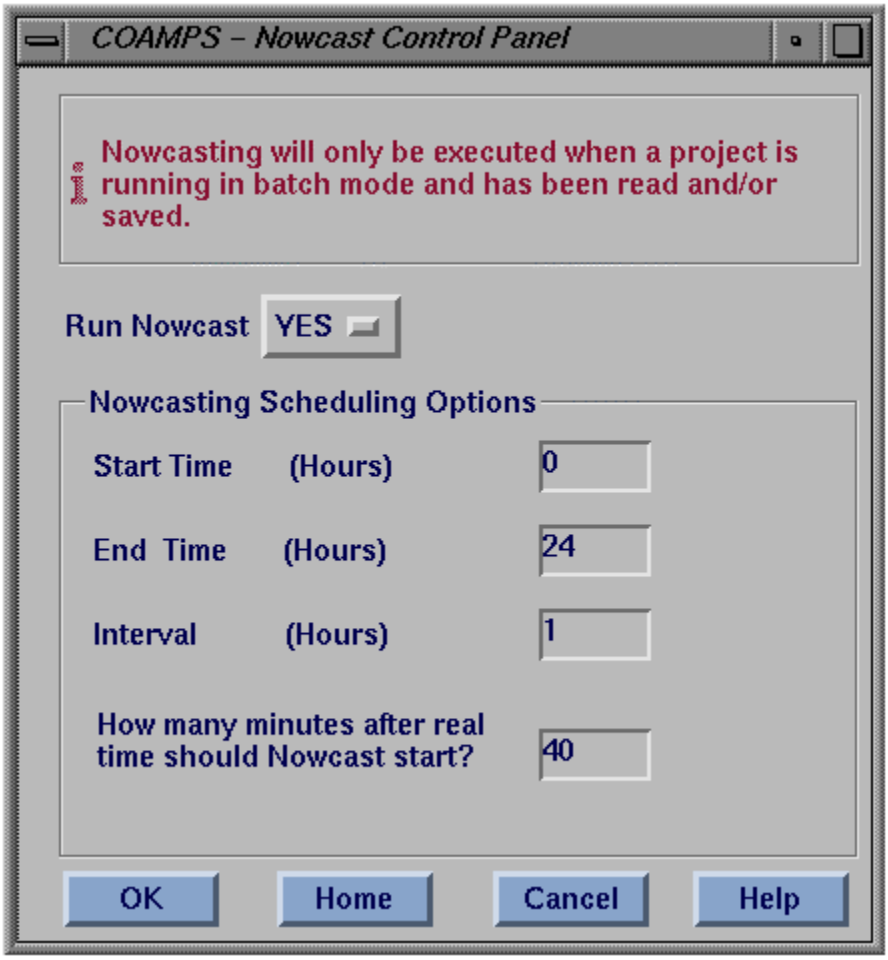


Figure 12. Nowcast Control Panel

A nowcast is an MVOI analysis of the forecast fields from a previous run or an earlier time step of the current run as a first guess field. By running the nowcast, you can keep the TEDS database continuously updated with gridded data fields so that the most current

and accurate data possible are always available to applications. Remember, nowcasting can only be executed on a project file which is running in batch mode (on the computer clock). Nowcast cannot be run interactively.

Currently, the nowcast output data are only available as grids in the TEDS database. No graphical display or web page has been set up to visualize the results.

The **Run Nowcast** selector is a simple yes/no selector to specify whether you want to run nowcasts. The items in the Output Times group specify how often and when to run the nowcast. The default values (shown above) start nowcasts at 00Z and end them at 24Z, running them at an interval of 3 hours (allowable values are every 1, 2, or 3 hr). Each nowcast is started 40 minutes after the time for which the nowcast is valid (this is to allow time for the observation data to be received and processed). You can change any of these values by typing in new ones.

The **OK** button accepts the values shown on the screen and closes the Nowcast Control Panel screen, returning you to the Main Control Panel. The **Home** button restores the default values. The **Cancel** button returns you to the Main Control Panel, without changing the values that were in effect before the current session of Nowcasting Options. The **Help** button brings up context-sensitive help concerning the Nowcast Control Panel.

When you have finished setting the Nowcasting Options, the red arrow beside the button will change to a green check, as shown below.

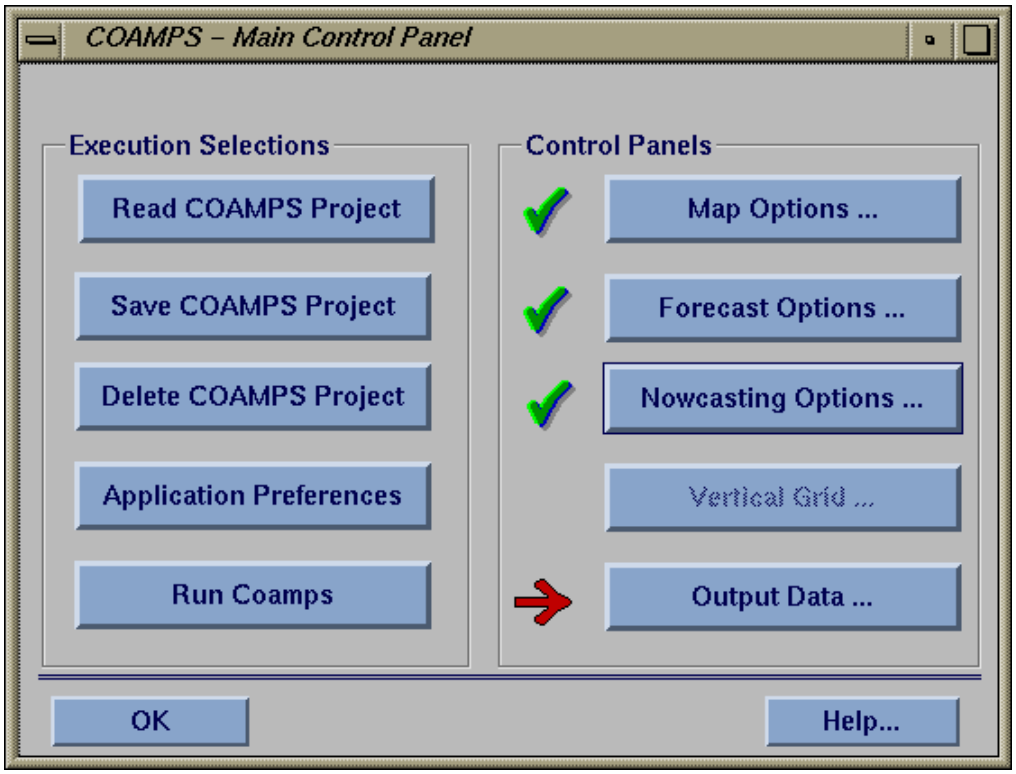


Figure 13. Main Control Panel After Selection of Nowcasting Options

HOW DO I SET THE VERTICAL GRID OPTIONS?

The "Vertical Grid" Control panel has been temporarily disabled. All COAMPS jobs will use the default 30 level vertical coordinate system and no user input is required.

Click on the **Vertical Grid…** button on the Main Control Panel to bring up the Vertical Grid Control Panel shown below. Specification of the vertical grid is a critical component of COAMPS and two grids – a 30 level and a 20 level scheme have been predefined. Normally, you will not need to change the vertical grid from the 30 level default. The 20 level grid is provided to speed up the running time of COAMPS when the vertical resolution is less important than the timeliness of the forecast.

There is a capability for you to define your own vertical grid. The User Defined option under the Number of Levels selector lets you specify the number of levels (up to 99) and the thickness of each level in meters. Changes to the vertical grid should be coordinated with the developers at NRL whose email address and phone number are listed in the front of this manual.

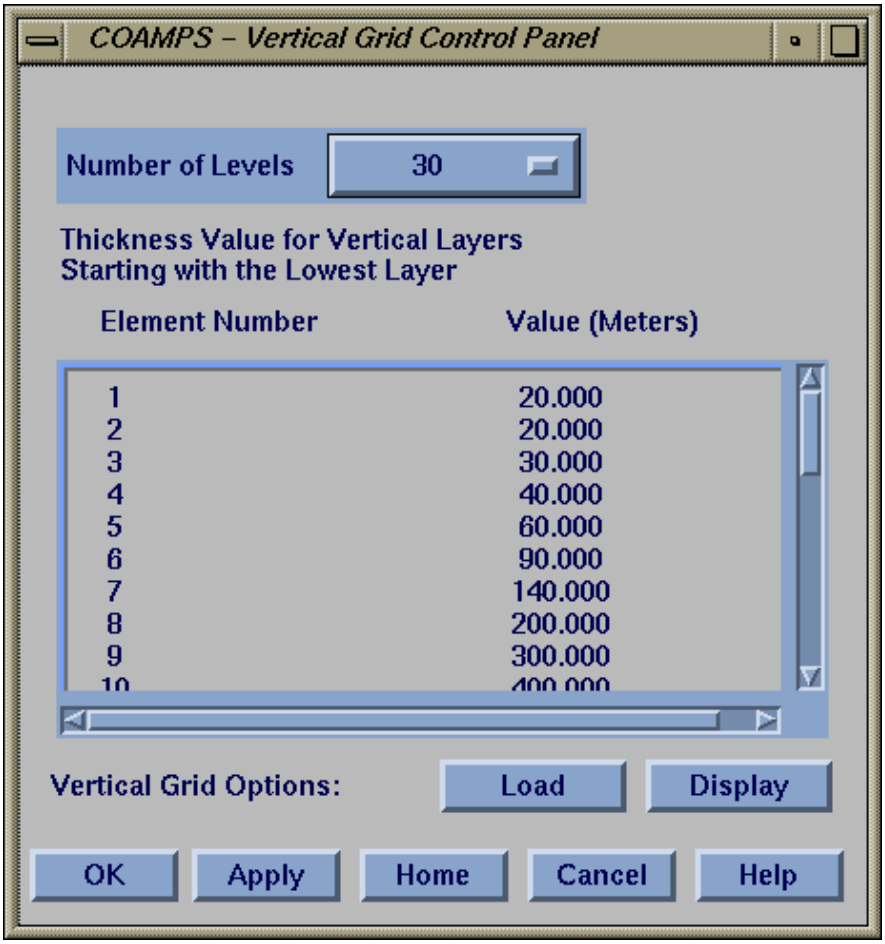


Figure 14. Vertical Grid Control Panel

The **Number of Levels** selector lets you select the number of layers for the analyses and forecasts. Remember the more layers you specify, the longer COAMPS will take to run.

The box below the levels selector shows the thickness values for the vertical layers, starting with the lowest layer from the ground up. In the example shown, the bottom layer and the next layer up are both 20 meters thick, the next layer (starting 40 meters above ground) is 30 meters thick, the next layer (starting at 70 meters above the ground) is 40 meters thick, and so forth. You can type new values into the list after consultation with NRL by selecting the User Defined Option.

The **Load** button allows you to load a set of layer definitions previously saved. This is useful if you want to re-use a customized vertical grid that has been used before. This option brings up a dialog showing a list of saved layer definitions (shown below) and allows selection of a file for reloading.

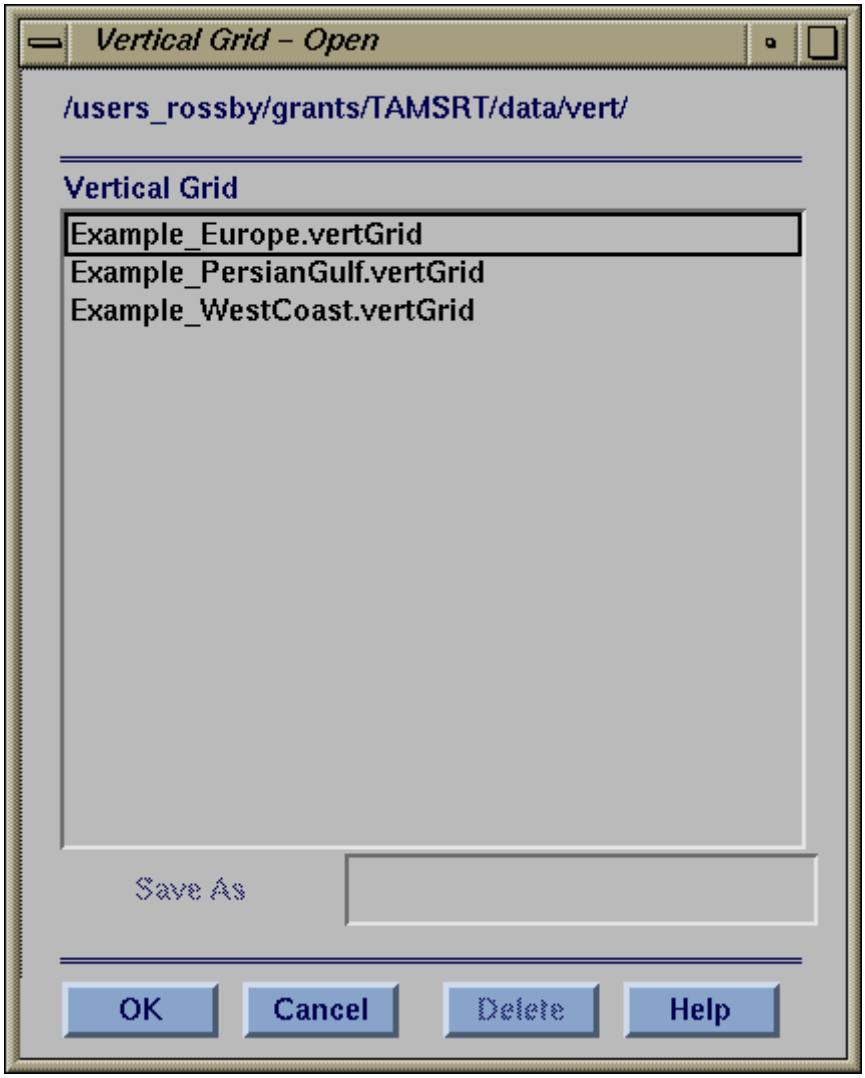


Figure 15. Load Vertical Grid Dialog

The **Display** button presents a graphical display of the vertical grid defined, as shown below.

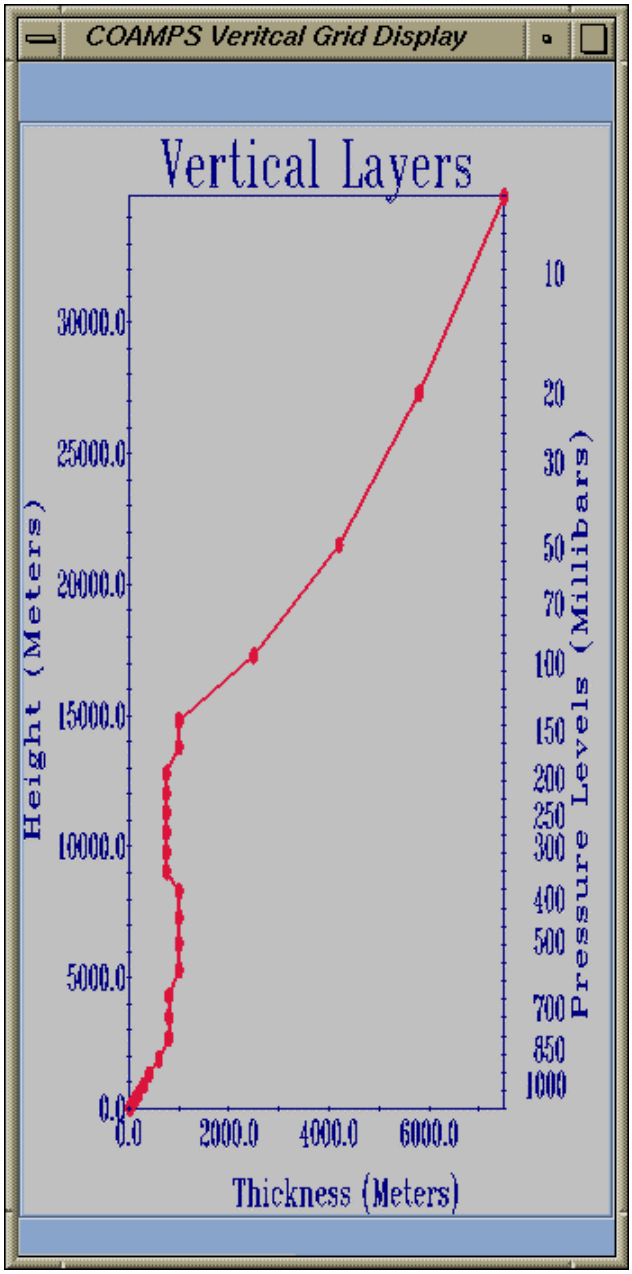


Figure 16. Vertical Grid Display

The display is updated via a change in the Vertical Grid Control Panel, editing values or changing the number of levels and then clicking the **Apply** button or **Display** button.. Each point shows the starting height and thickness of a layer.

The **OK** button in the Vertical Grid Control Panel accepts the current values and closes the Vertical Grid Control Panel, returning you to the Main Control Panel with the Vertical Grid option checked. The **Apply** button updates the graphic and applies your

changes but doesn't close the control panel. The **Cancel** button closes the Vertical Grid Control Panel without making any changes. The **Home** button returns all values to the defaults. The **Help** button brings up help about the Vertical Grid Control Panel.

When you have completed the Vertical Grid options selection, the Main Control Panel will show a green check next to this option, as shown below.

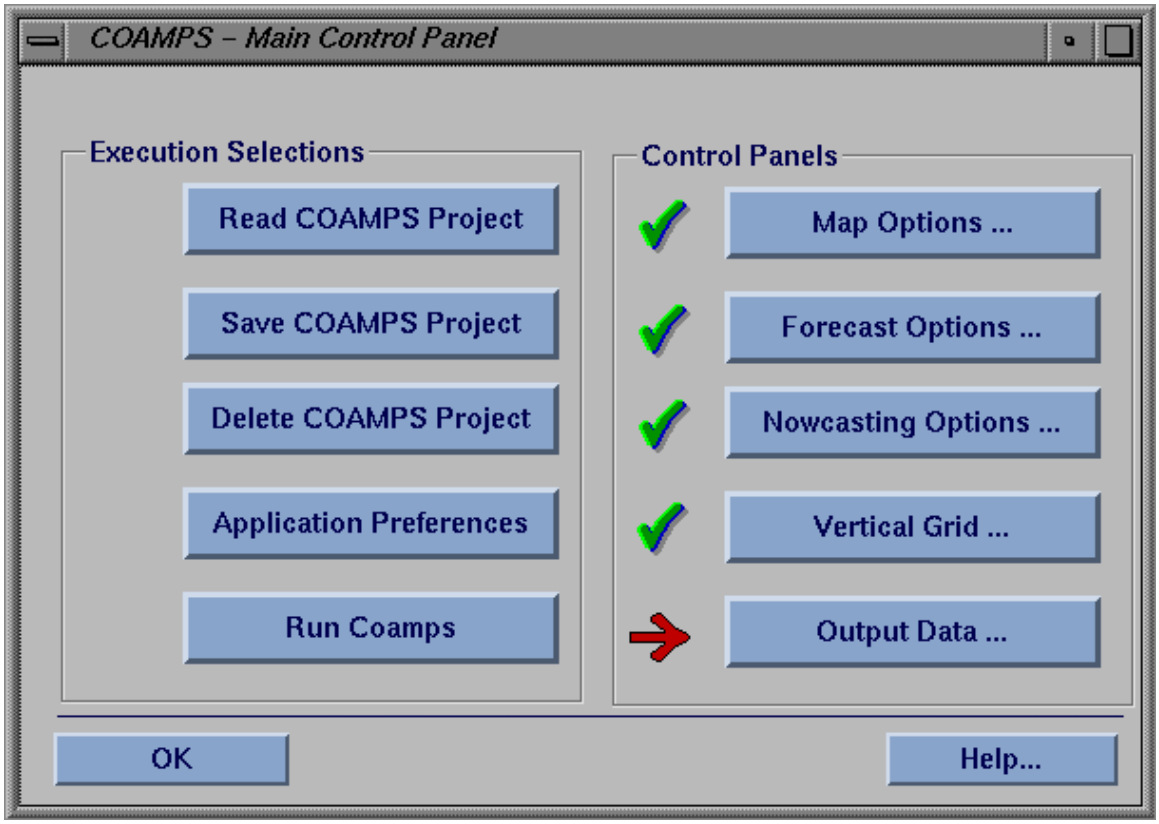


Figure 17. Main Control Panel After Selection of Vertical Grid Options

HOW DO I SET THE OUTPUT DATA OPTIONS?

Click on the **Output Data** button to bring up the Output Control Panel, shown below.

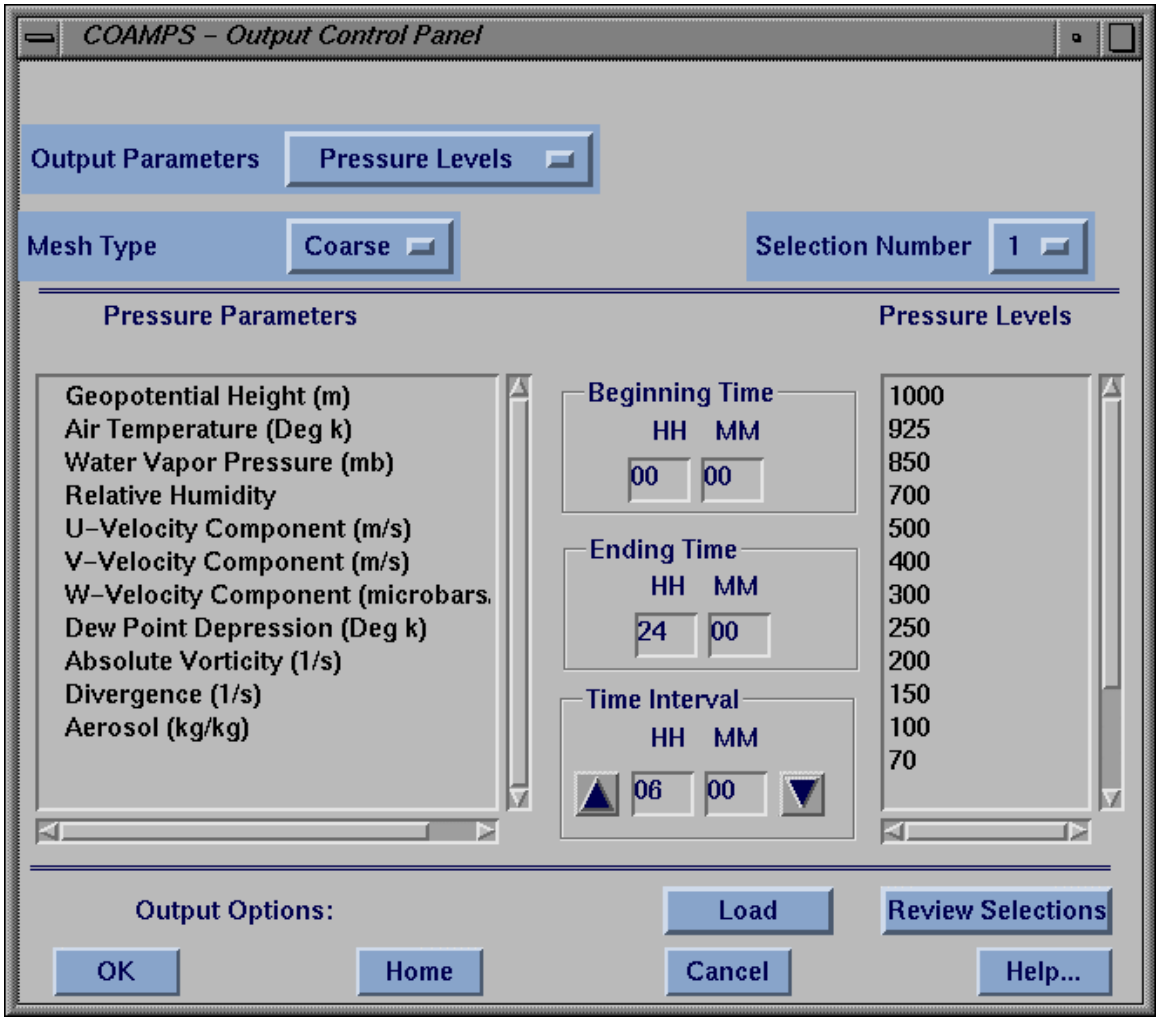


Figure 18. Output Control Panel

The Output Control Panel allows you to select the outputs that the COAMPS Model will produce. The rules that apply to these selections are:

- You may select any combination of parameters and times for each selected Mesh.
- You are allowed four different combinations of selections per each Level and each Mesh.
- You may select any number of items per parameter type and mesh type; there are no limitations.

- The selected items will be the only output from the COAMPS model run processed into web graphics, so please check selections carefully by viewing the Selected Output via Review Selections.

The examples below will show you how to use the Output Control Panel to select items for output. First, however, some background on the controls in the Output Control Panel:

- The **Output Parameters** selection button allows you to select between Pressure Level Parameters, Height Surface Parameters, and Surface Parameters.

- The **Mesh Type** selection button allows you to select the Mesh: Coarse, Medium, Fine, and Inner.

- The **Selection Number** allows you to set the current selection number – you may have four different combinations of parameters and times for each Output Parameter and Mesh Type combination.

- The **Beginning Time** indicates the time to start to output the selected parameters. The values are entered as Hours and Minutes for each combination selection.

- The **Ending Time** indicates the time to stop outputting the selected parameters. The values are entered as Hours and Minutes for each combination selection.

- The **Time Interval** indicates how often to output the selected parameters. The values are entered as Hours and Minutes for each combination selection. The arrow buttons allow the user to increase or decrease the time interval by an amount which is an acceptable output interval for the selected data area.

- The **Load** button may be used to load a previously defined set of output options. It is sometimes easier to do this than to start from scratch.

- **Review Selections** displays the output selected in the format of the COAMPS model input file. If the user output selections are modified and the Selected Output window is open the Review Selections button must be re-initiated for the output window to update. The window can be closed by the **OK** button.

Here are some examples showing the use of the Output Control Panel.

Example 1: Choosing Parameters for Pressure Levels

1. Choose Pressure Levels on the **Output Parameters** selection button.

2. Choose the mesh on the **Mesh Type** selector button.

3. Choose the selection number on the **Selection** button.

4. Select the parameters to be output by clicking on each one to highlight it (if you decide you don't want one of the highlighted items, just click on it again). The figure below shows the Output Control Panel with a group of parameters highlighted.

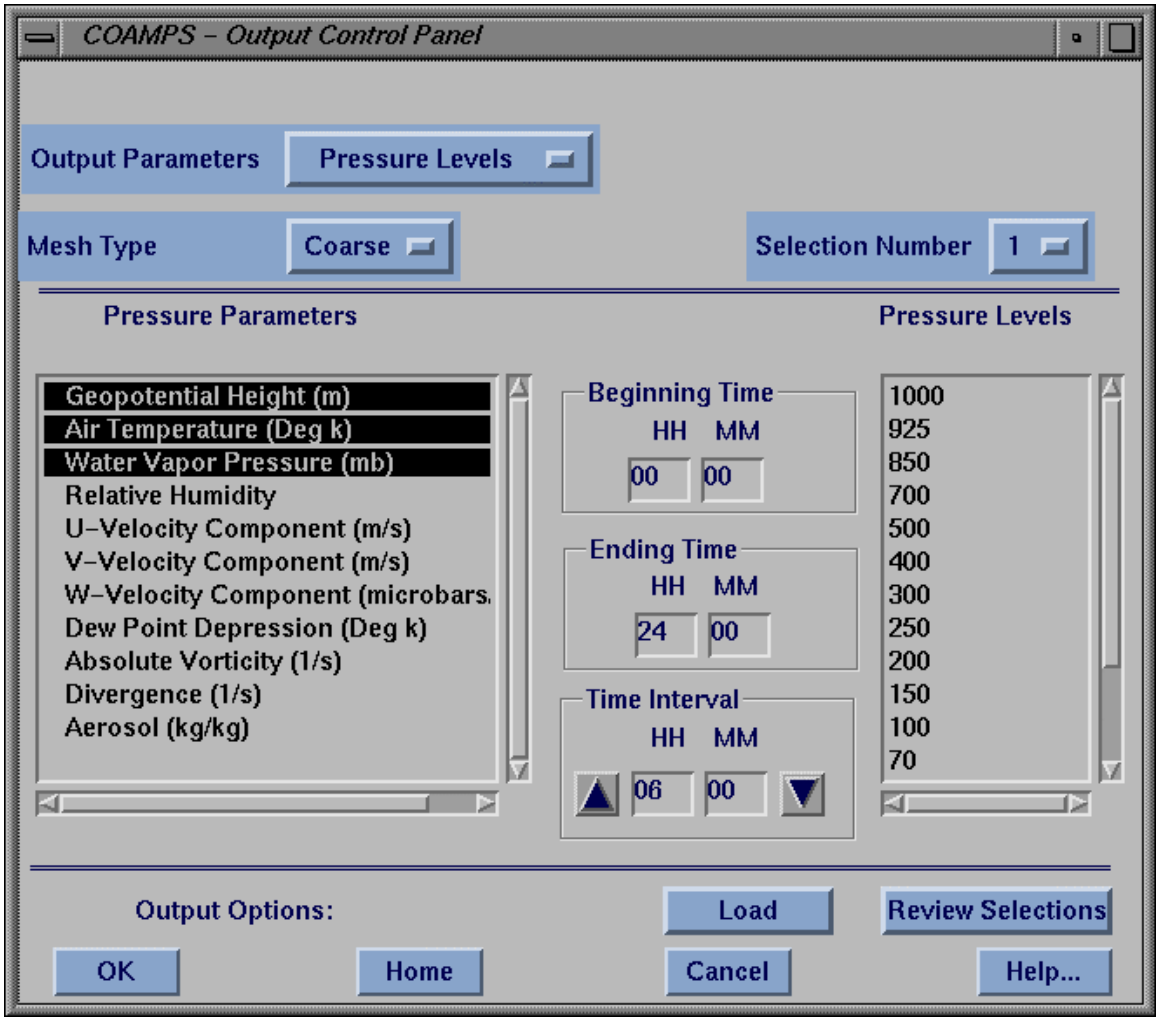


Figure 19. Output Control Panel With Pressure Parameters Highlighted

5. Select the pressure levels for these parameters by clicking on each desired level to highlight it. The figure below shows the Output Control Panel with pressure levels highlighted for the selected parameters.

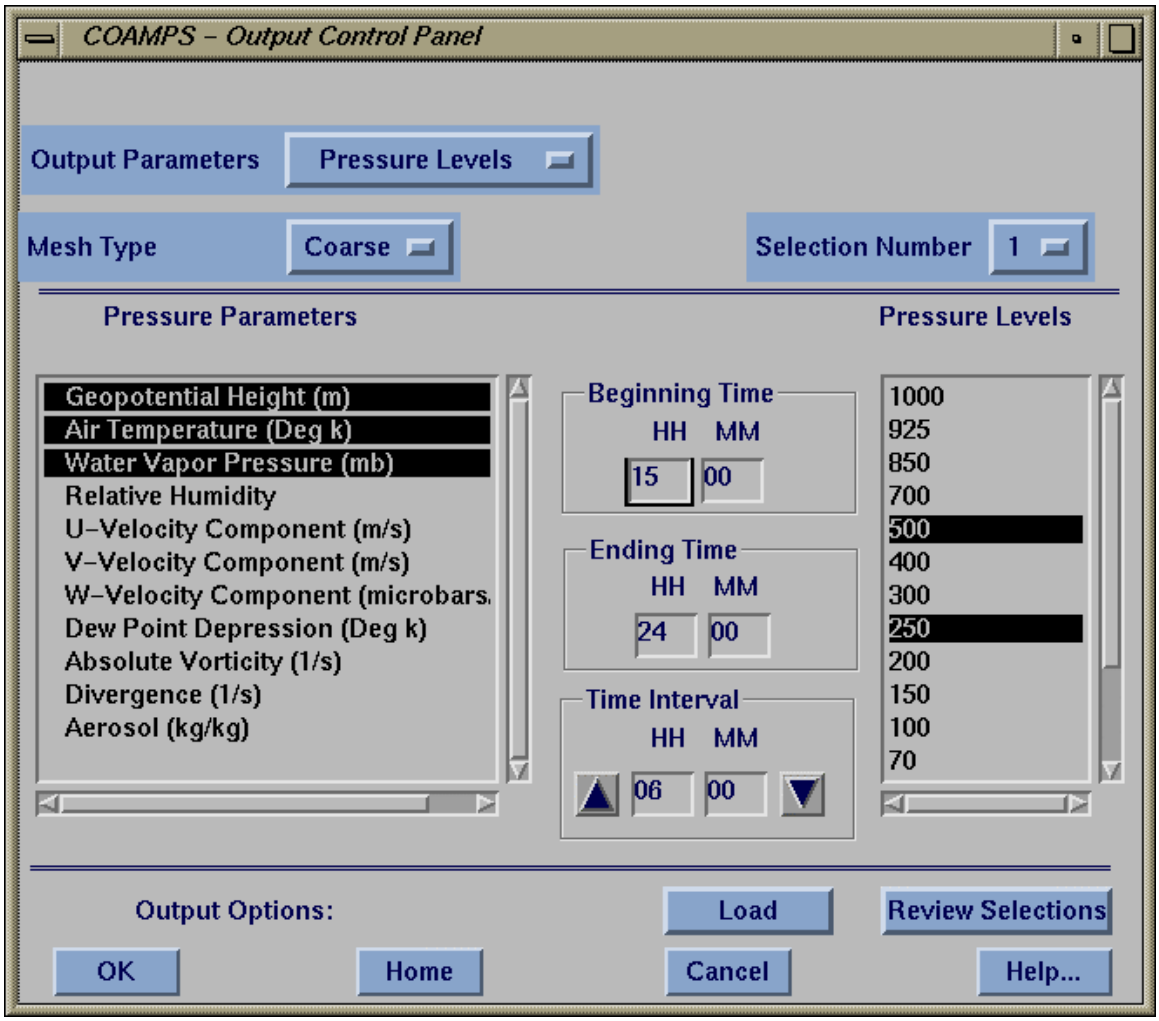


Figure 20. Output Control Panel with Parameters and Levels Selected

6. Enter the Beginning Time, Ending Time, and Time Interval for these parameters. The Beginning and Ending Time are in forecast hours (tau) from the base time; that is, a Beginning Time of 12 hours 00 minutes means that tau 12 fields will be the first ones produced. Likewise an Ending Time of 24 00 means that tau 24 fields will be the last ones produced for this selection.

7. If you have finished with your choices for this selection, click on the **Selection Number** button to start a new selection. This may be another selection using pressure levels (perhaps with different parameters or levels or times), or a selection using any of the other Output Parameters options. If you've finished making selections, click on the **OK** button to accept the selections and return to the Main Control Panel.

Example 2: Selecting Data for Height Surfaces

When you select **Height Surface** on the **Output Parameters** selector, the Output Control Panel displays the height level selections as shown below.

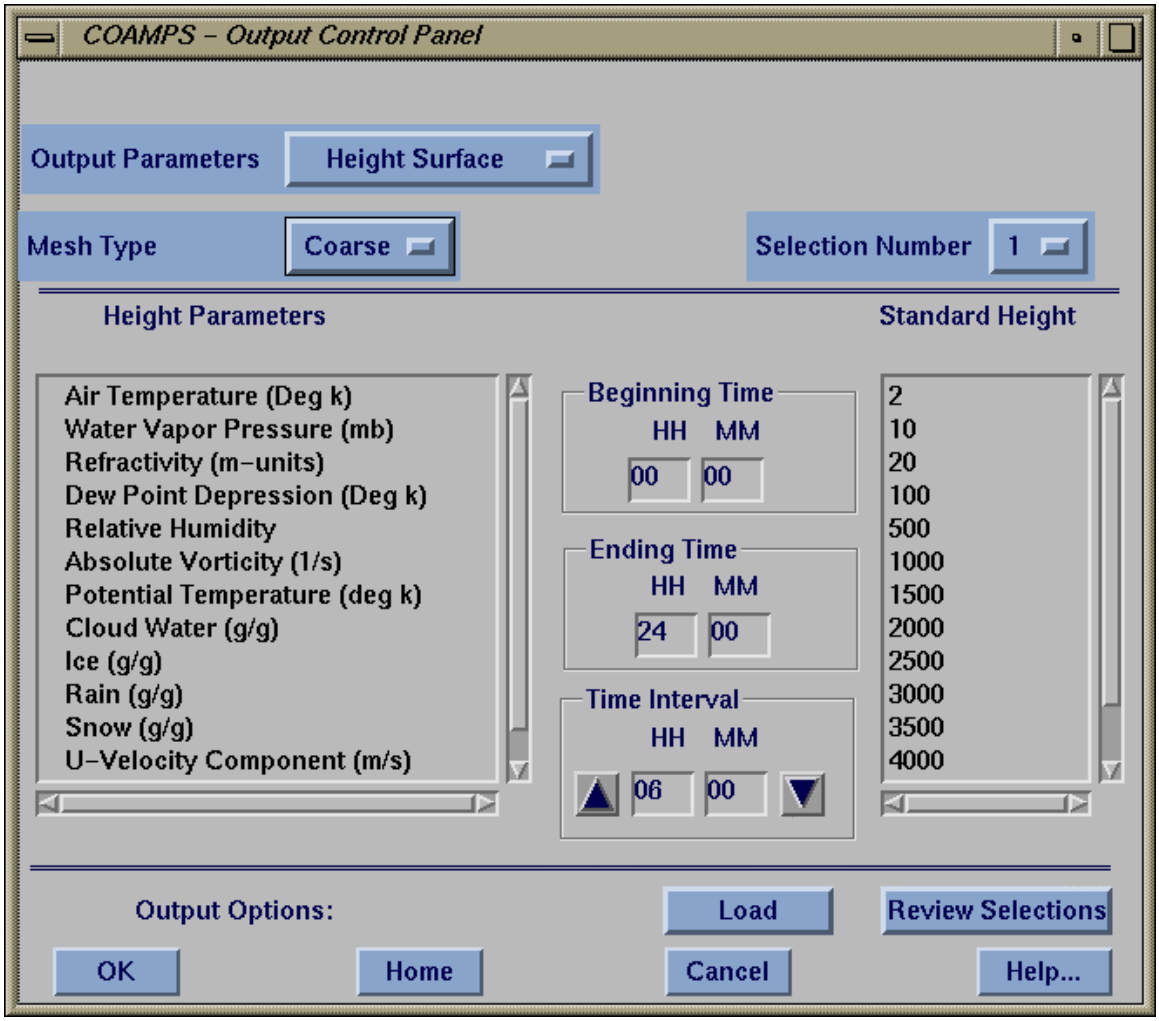


Figure 21. Output Control Panel Showing Height Surface Parameters

The two list boxes show the available parameters (on the left) and the standard height surfaces (on the right). To make a selection set:

1. Ensure that the **Selection Number** selector is set to the desired selection number. If you already have a Selection (1) set for this particular **Output Parameter** or **Mesh Type**, you should change the selection number unless you want to overwrite the existing Selection (1) set with a different set. Selections from different **Output Parameter** or **Mesh Types** will not overwrite each other.

2. Select the Height Parameters that you want in the output. Just click on each desired parameter to highlight it. When you have set several parameters, the screen will look as shown below.

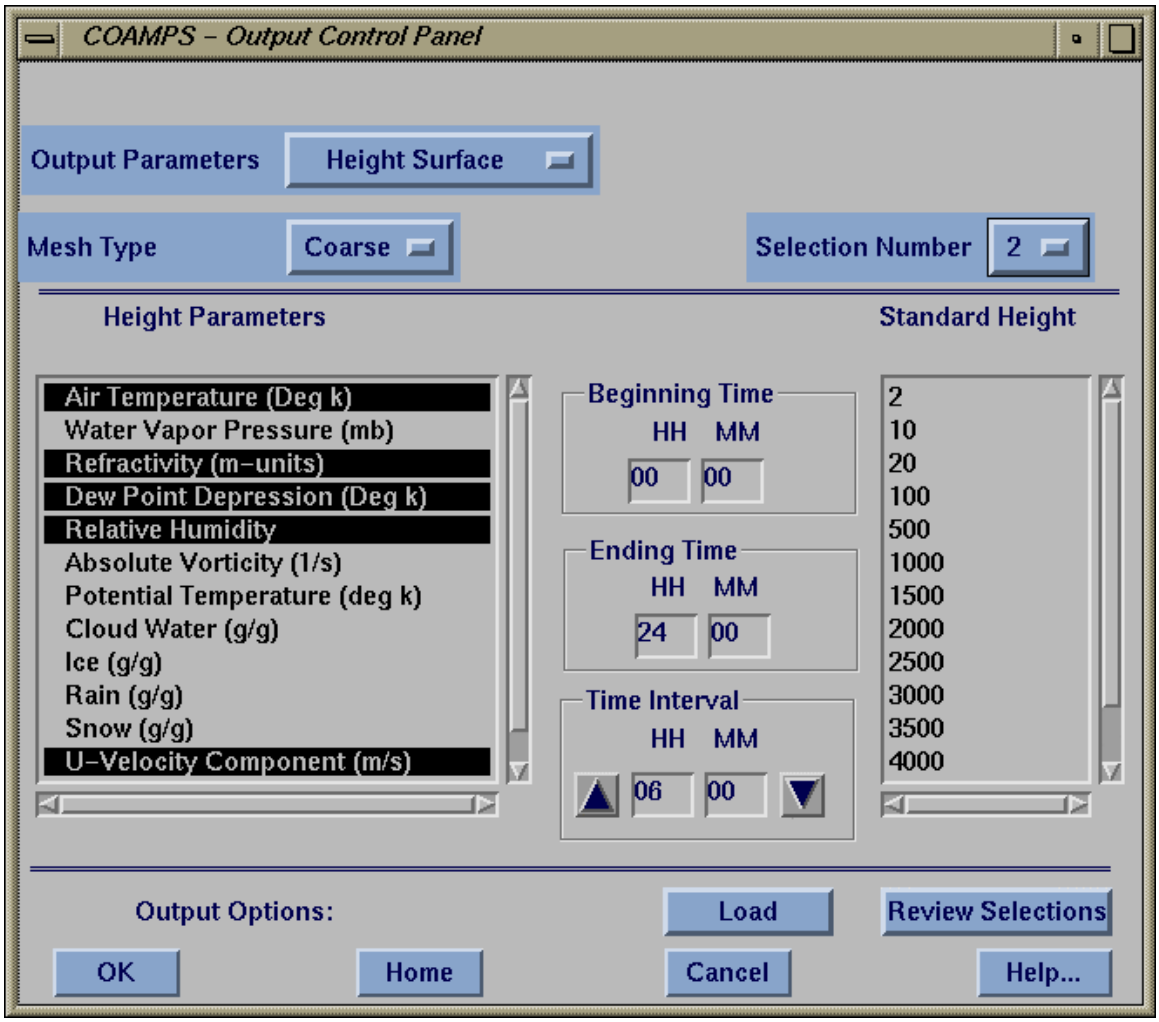


Figure 22. Output Control Panel With Height Parameters Selected

3. Select the Standard Heights for which these parameters will be output. Again, click on each desired height to select it. You can toggle a selected level off by clicking on it again. When you're finished, the screen should look something like this:

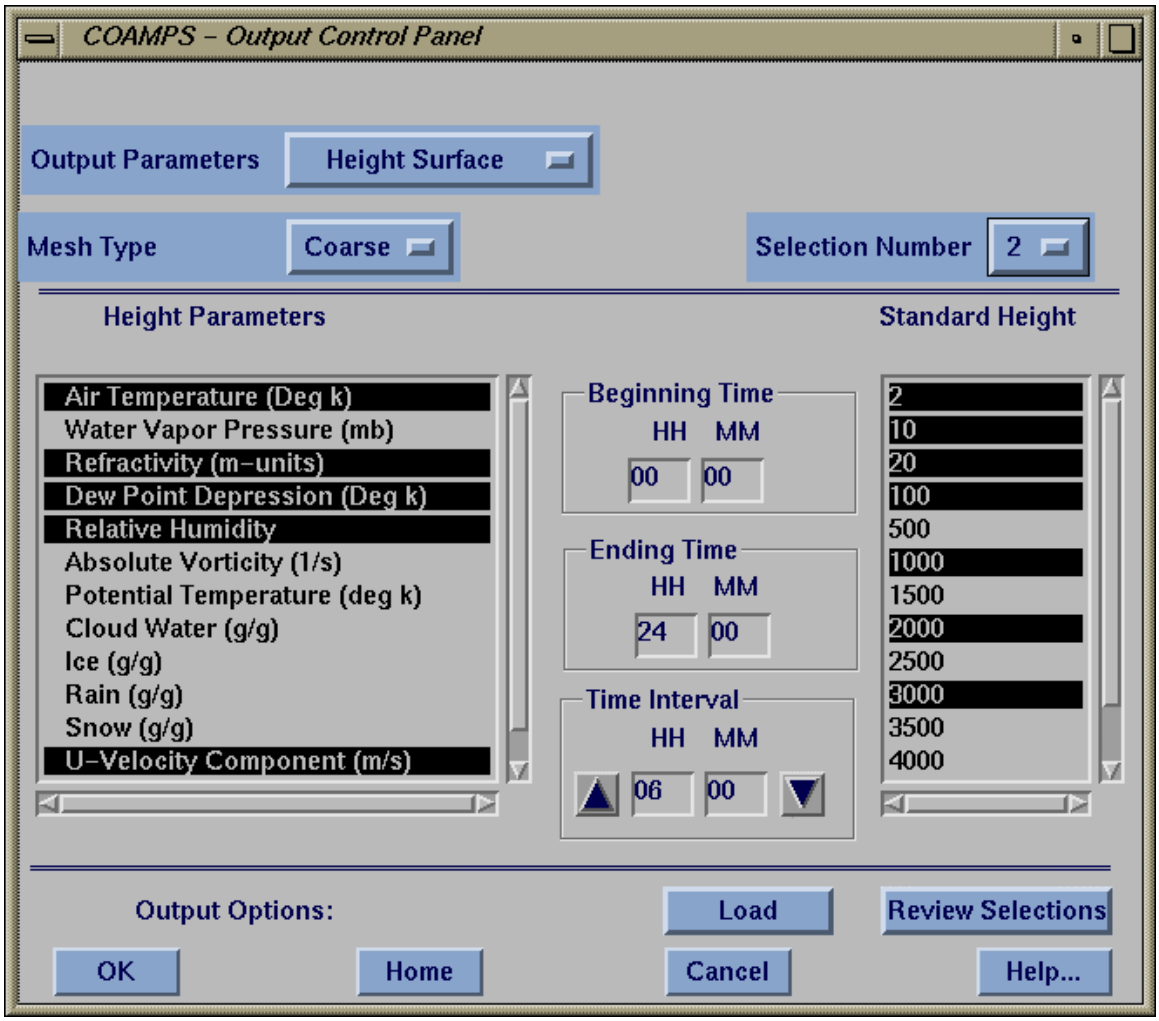


Figure 23. Output Control Panel With Height Parameters and Heights Selected

4. Set the Beginning Time, ending Time, and Time Interval for the forecasts.

5. If you have finished with your choices for this selection, click on the **Selection Number** button to start a new selection. This may be another selection using height surfaces (perhaps with different parameters or levels or times), or a selection using any of the other Output Parameters options. If you've finished making selections, click on the **OK** button to accept the selections and return to the Main Control Panel.

Example 3: Selecting Output for Surface Parameters

Selecting the **Surface Parameters** option on the **Output Parameters** selection button displays the Surface Parameters options in the Output Control Panel, as shown below.

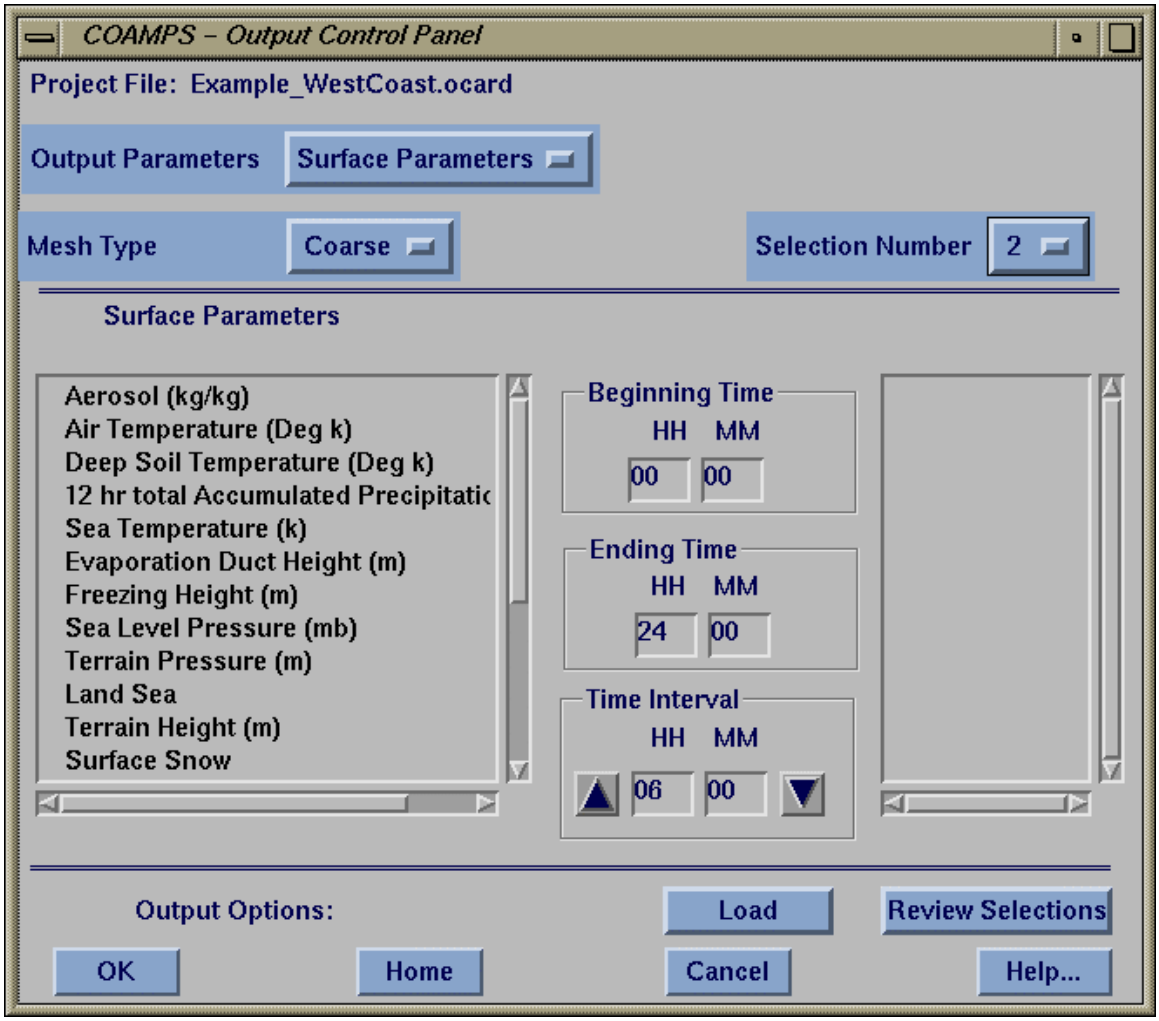


Figure 24. Output Control Panel Showing Surface Parameters

Note that for the Surface Parameters there is no level selection. To select surface parameters for output, just click on each parameter desired. To deselect one that is already selected, just click on it again. Then set the Beginning and Ending Times and Time Interval. Click the Selection Number button to start a new selection or click the **OK** button to accept the selections and return to the Main Control Panel.

Reviewing Your Selections

At any time during the selection process, you can click on the **Review Selections** button to see a list of the items you have selected. This action opens a display like the one shown below.

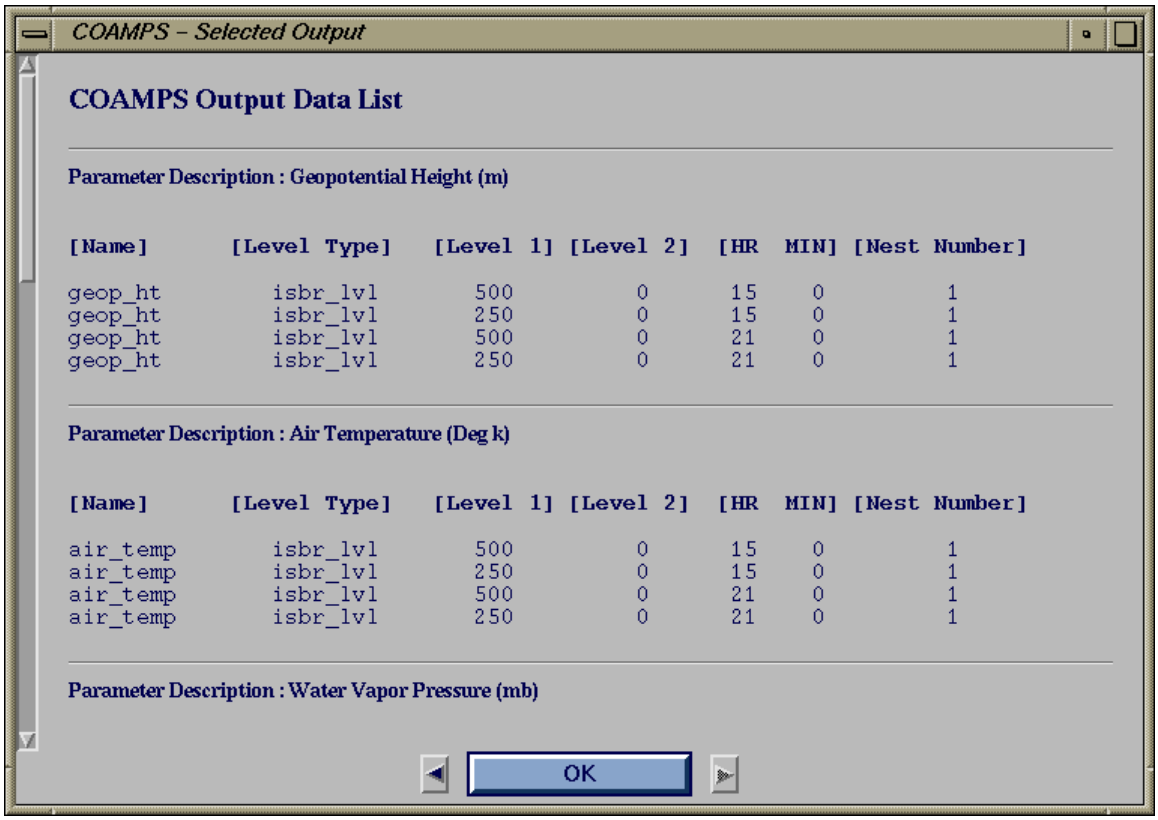


Figure 25. Review Selections Display

You can scroll the display using the scroll bar (grab and drag the bar in the middle, or click on the up and down arrows at the ends). The **OK** button closes the Review Selections dialog.

Completing the Output Data Selection Process

When satisfied with all of your selection sets, click the **OK** button at the bottom of the Output Control Panel. This will return you to the Main Control Panel, which will now display a green check next to the **Output Data** button, as shown in the figure on the next page.

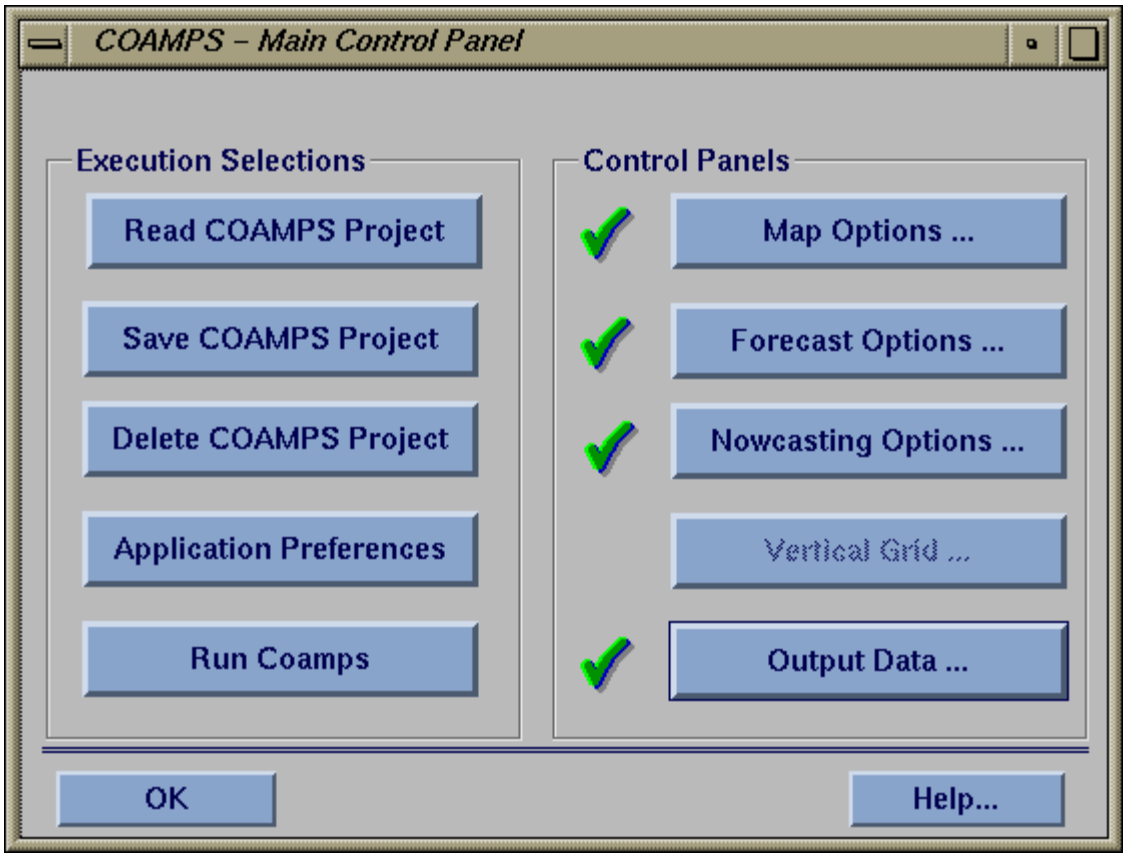


Figure 26. Main Control Panel With Output Data Selection Completed

HOW DO I RUN COAMPS?

When you have completed entering or reading all of the inputs, you will need to click on the **Save COAMPS Project** button to save your inputs for future use. You can then click on the **Run COAMPS** button to run the COAMPS model with the specified input set.

After you save your project, you can use the same inputs again later without having to go through all of the definition steps discussed above. Since the inputs you made in each of the control panels are stored separately, you'll be able to load saved inputs in any of the control panels and reuse them or modify them slightly for the next job. You can recall an entire saved project using the **Read COAMPS Project** button. If you try to run COAMPS without saving the current project, you'll get an error message.

Here are the steps to save a project and run COAMPS (this assumes that all of the control panels have green checks as shown above, meaning all inputs are complete):

1. Click on the **Save COAMPS Project** button. This opens a Run Time Estimate dialog as shown below. The purpose of this dialog is to show you the estimated run time of the project you have defined, and allow you to change the project definition if the project will run too long. Click the **Cancel** button to cancel the run and return to the

Main Control Panel if you want to change the project. Otherwise, click **Continue With Save** to save the project as currently defined.

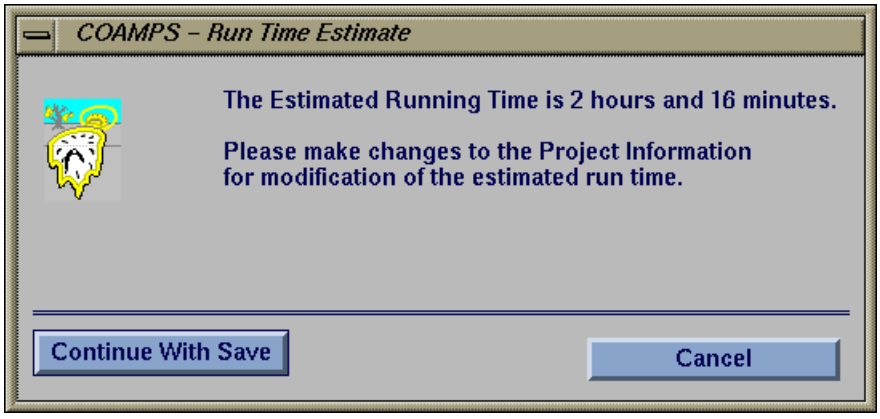


Figure 27. COAMPS Run Time Estimate Dialog

2. Clicking the **Continue With Save** button brings up the Save dialog shown below.

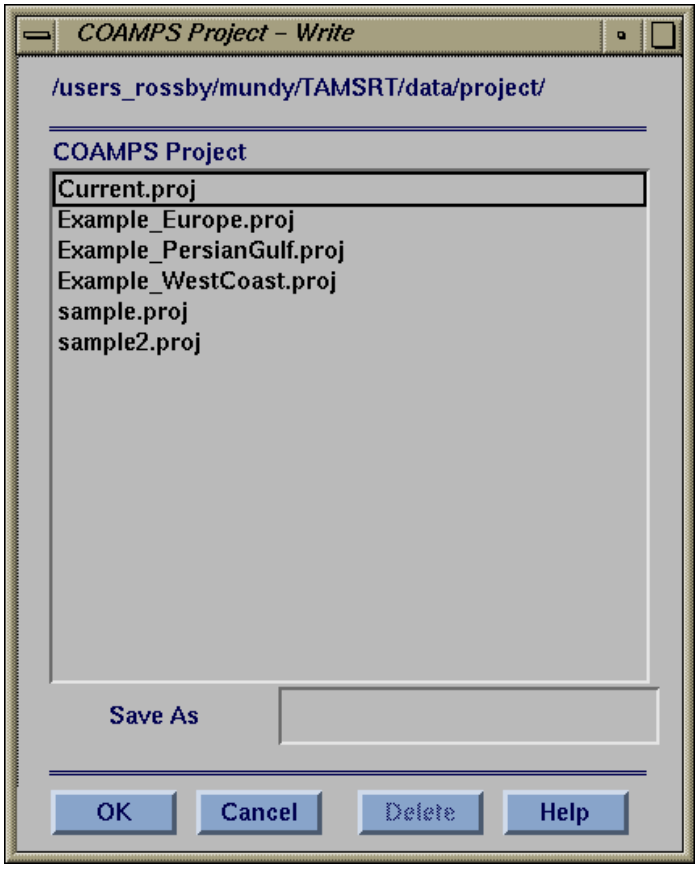


Figure 28. COAMPS Project Write Dialog

Just type a name in the Save As box and click **OK** to save the project.

3. Back on the Main Control Panel, click the **Run COAMPS** button. This opens the Run Setup Control Panel, shown below.

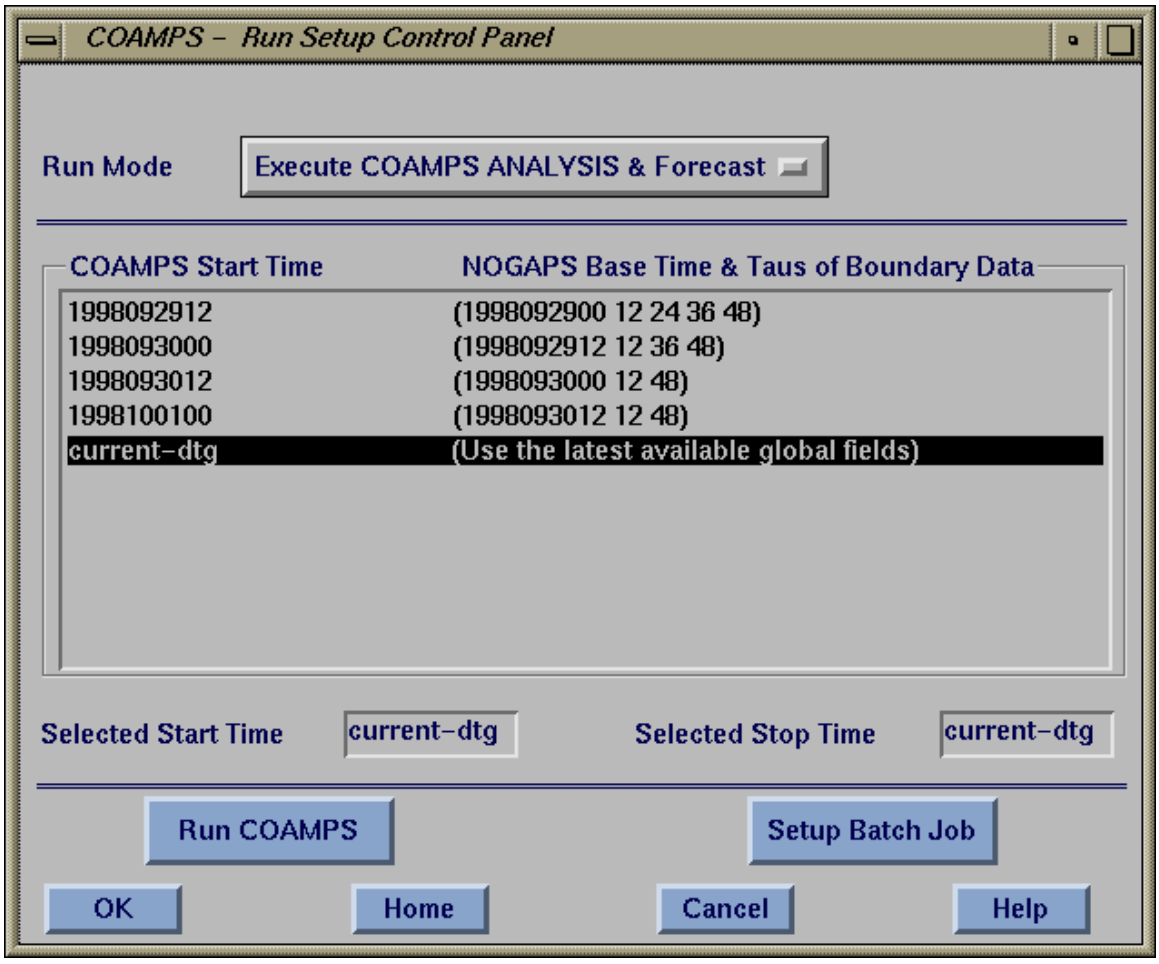


Figure 29. Run Setup Control Panel

4. Select the Run Mode. The **Run Mode** selector has the following options:

   - **Generate COAMPS Name List Only** – This option generates the input file for COAMPS but does not actually run the model. This allows you to check the file in a popup window and edit your settings in the GUI before using it for a COAMPS run, if desired.

   - **Execute COAMPS Analysis** – This option will run the COAMPS analysis when the **Run COAMPS** button is clicked.

   - **Execute COAMPS Forecast** – This option runs only the COAMPS forecast when the **Run COAMPS** button is clicked.

   - **Execute COAMPS Analysis & Forecast** – This option runs both the analysis and the forecast when the **Run COAMPS** button is clicked.

5. Select a Start Time. The COAMPS Start Time must be specified so the model will have a data set to start with. Select the desired data set from the displayed list by clicking on the entry in the list. The selection of the current date time group, ***current-dtg***, will allow the model to use the latest data available when the COAMPS model execution begins; this is the preferred option.

6. 6. If you want to run the COAMPS model immediately, click on the **Run COAMPS** button. A verification dialog will open, and when you click the **OK** button, the model run will start and you'll see a status screen like the one shown below.

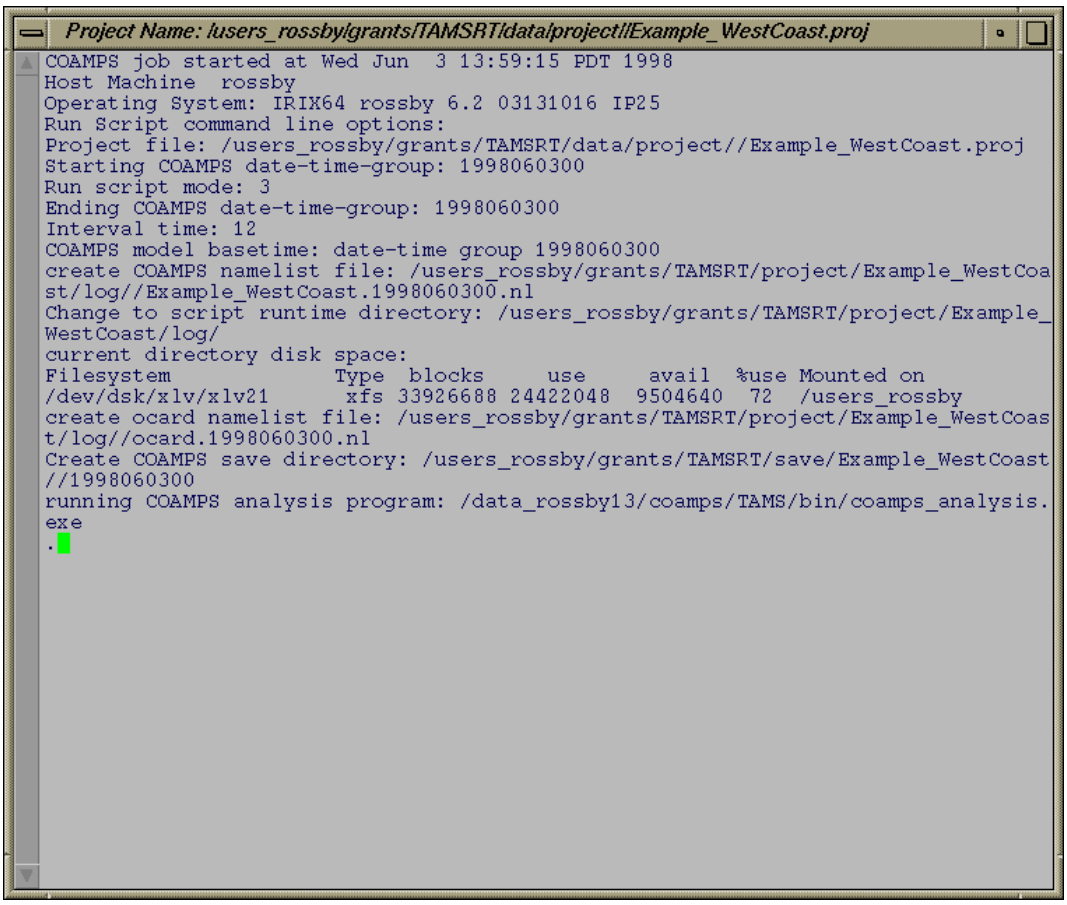


Figure 30. COAMPS Run Status Display

This display will be continually updated until the COAMPS run is finished. Any error messages from the run will appear here, as will notification that the run is completed. Upon completion of the run, the COAMPS fields will be placed in the TEDS database where they can be accessed by other programs and web graphics will be created for visualization. This TAMS/RT GUI does not provide any display capability for the COAMPS fields.

7. If you want to set up COAMPS runs based on the computer schedule, click on the **Setup Batch Job** button in the Run Setup Control Panel. This brings up the Batch Setup Control Panel:

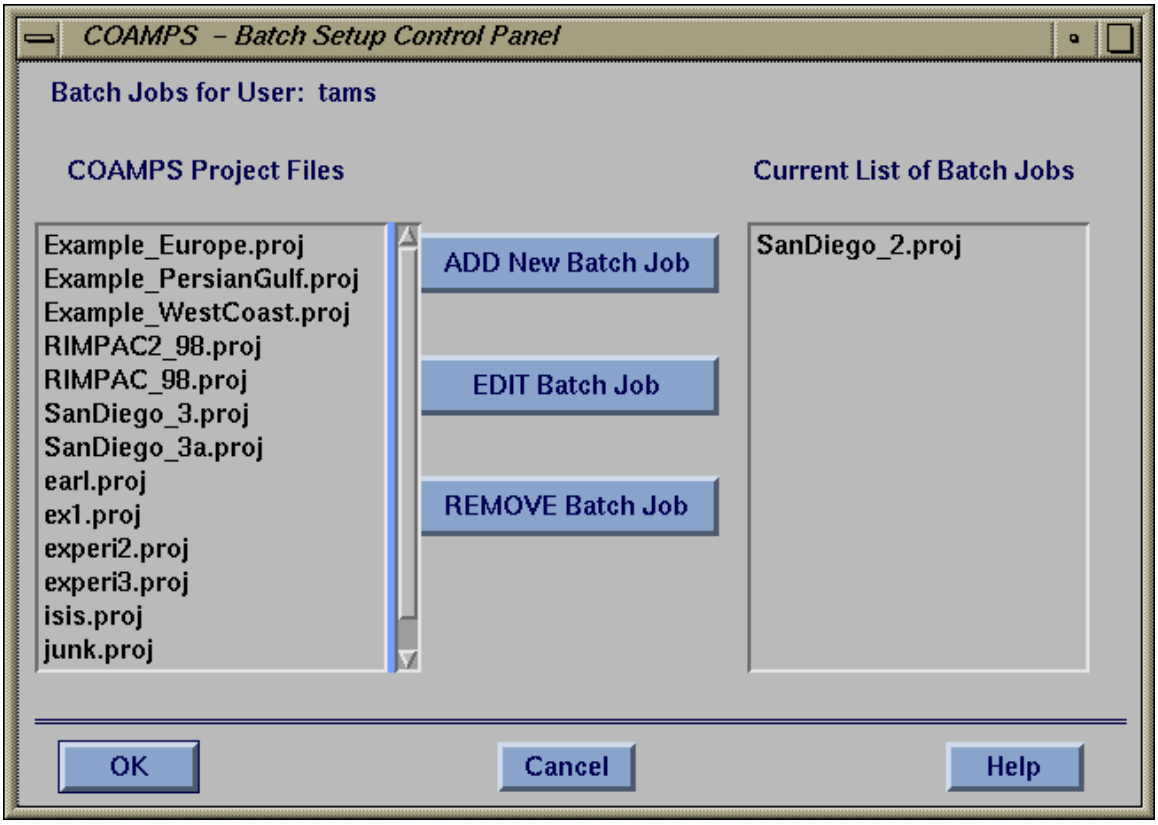


Figure 31. Batch Setup Control Panel

Select a project from the COAMPS Project Files listing and click on the **Add New Batch Job** button. This brings up the Add Batch Job Control Panel, shown on the next page.

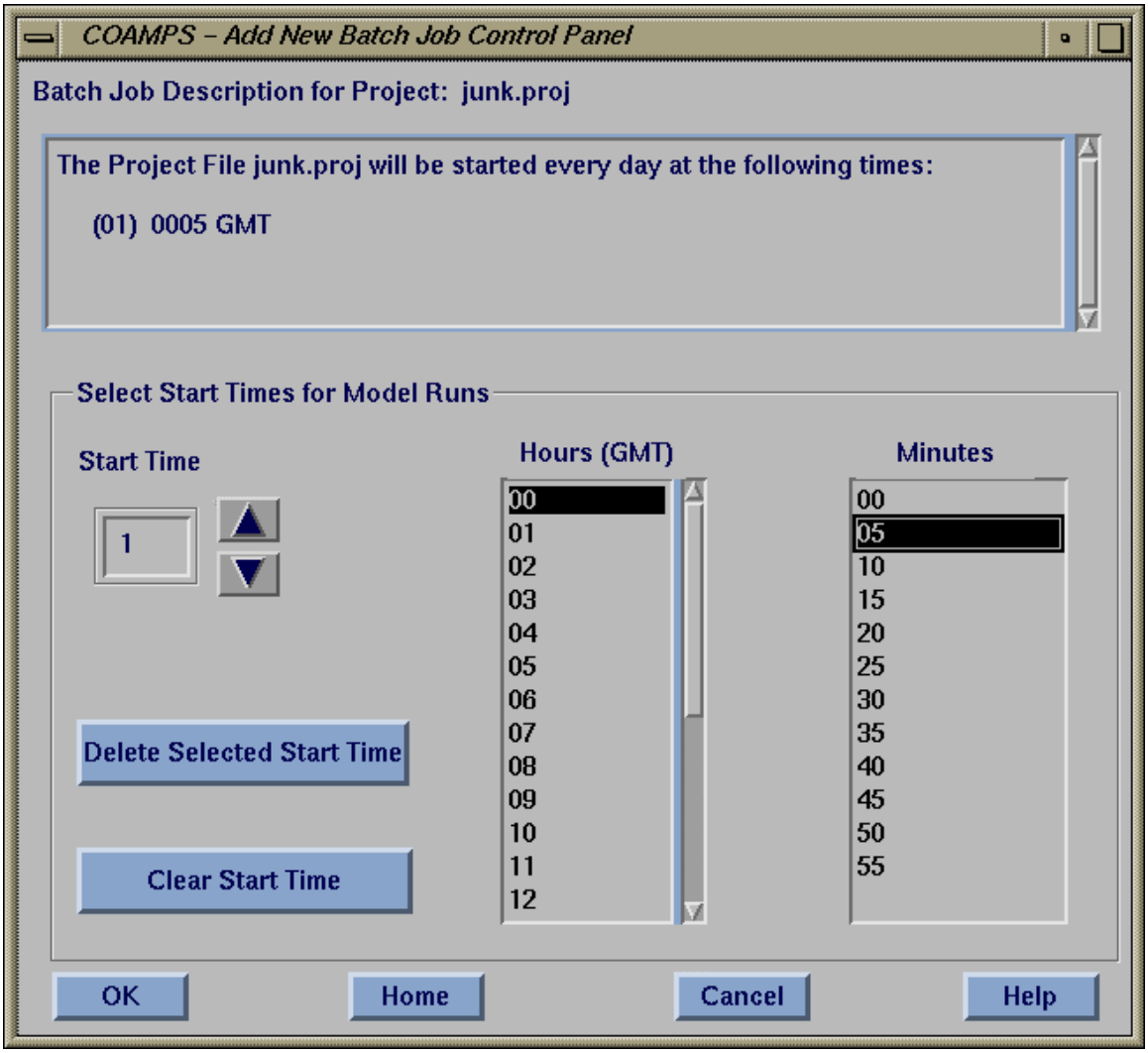


Figure 32. Add New Batch Job Control Panel

You can use this panel to schedule start times for batch COAMPS runs (these are runs done at scheduled times, without any further operator intervention). For the first start time, all you need to do is select the Hours (GMT) and Minutes of the time at which the run will be started. Typically, you would want to start model runs at about +2 to +3 hr in the watch to allow all the observational data to be received. When you make a selection, the selected start time will appear in the Batch Job Description box as shown in Figure 31 above. You can then increment the start time counter and select another start time, if desired. You can specify up to 24 start times. Figure 32 on the next page shows the Add Batch Job Control Panel with 2 start times specified. You can delete one of the start times by using the Start Time counter to go to the one you want to delete and then clicking on the **Delete Selected Start Time** button. Clicking the **Clear Start Time** button clears the currently selected start time and allows you to enter a new time.

u **NOTE:** You must have access to the *cron* (the UNIX computer scheduling facility) to schedule a batch job. If you have any problems scheduling a job, contact your System Administrator to make sure you have this privilege.

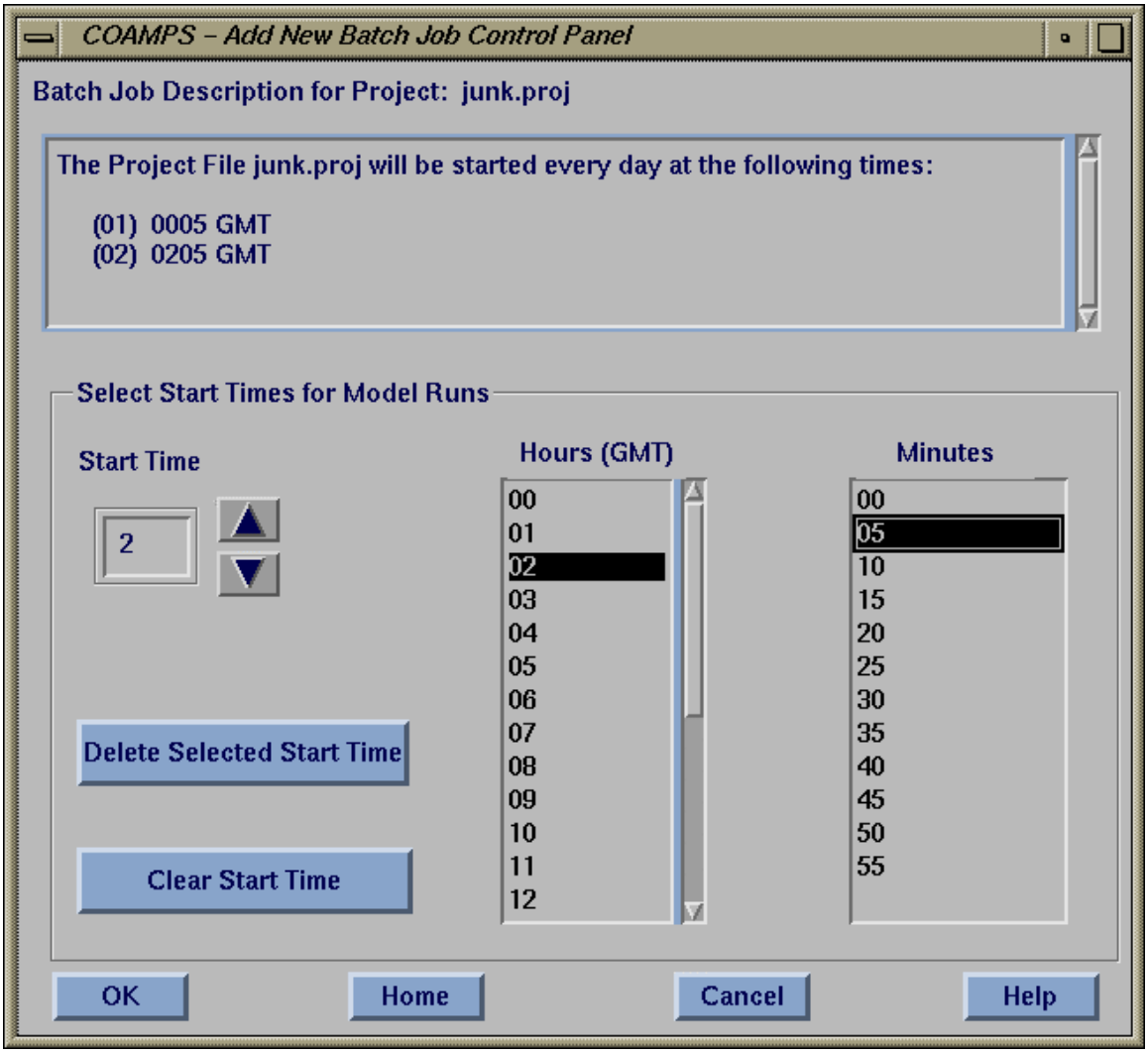


Figure 33. Add New Batch Job Control Panel With a Start Time Selected

When all desired start times have been specified, click the **OK** button to schedule the batch job. A COAMPS run as specified in the project file will then be automatically started at each of the scheduled start times every day.

HOW DO I RE-USE AN EXISTING COAMPS PROJECT?

The **Read COAMPS Project** button on the Main Control Panel makes it easy to read in and re-use a project that you saved previously. When you click on this button, a file selection dialog like the one shown below will appear.

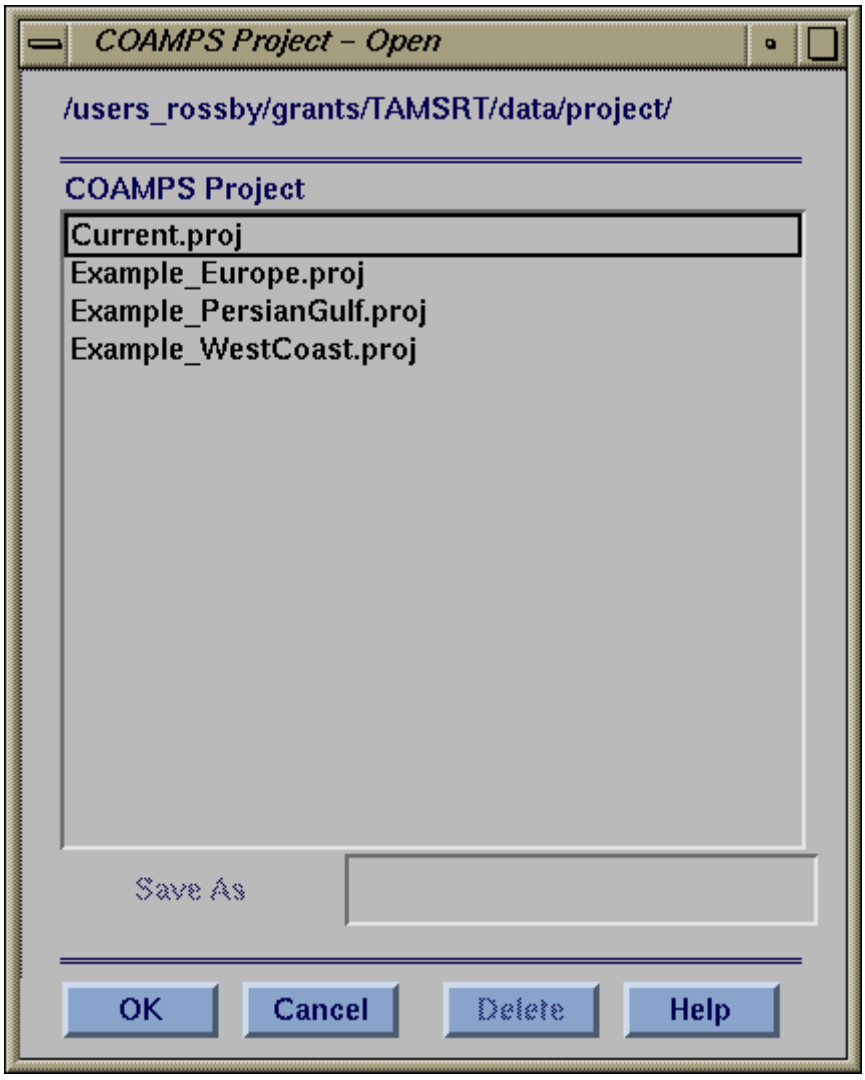


Figure 34. COAMPS Project - Open Dialog

To open a project, just click on the project name to highlight it and click the **OK** button or double click on the project name. You will find that when you open a previously defined project, all of the red arrows in the Main Control Panel will have changed to green checks, indicating that all of the necessary definition steps have been performed and you can, if desired, run COAMPS immediately using this project. You can also edit the project and save it with a different name (using the Save As entry box in the Save Project dialog). Re-using projects in this way can save you a lot of time.

HOW DO I DELETE A PROJECT?

If you're certain you are finished with a project definition, you can delete it. Click on the **Delete COAMPS Project** button on the Main Control Panel. The COAMPS Project - Delete dialog will appear, as shown below.

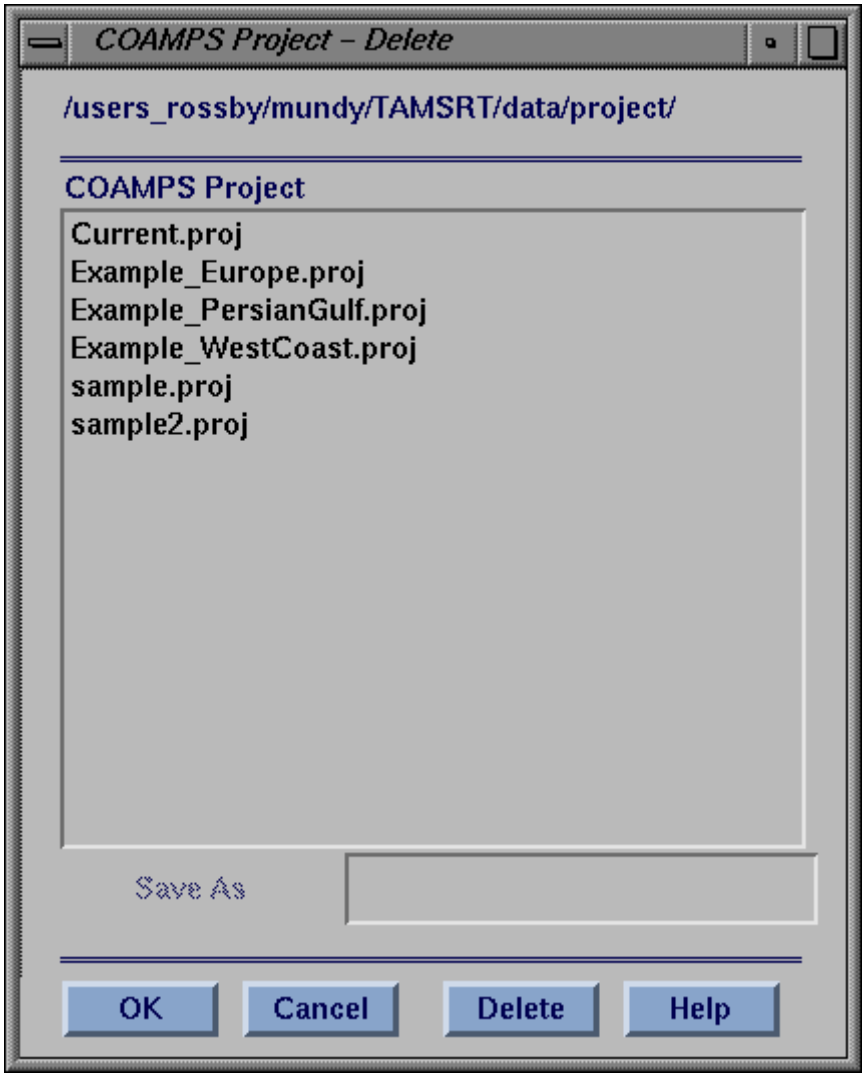


Figure 35. COAMPS Project - Delete Dialog

To delete a project, click on its name and click the **Delete** button. A Confirmation dialog like the one shown on the next page will then appear. This dialog gives you the option to delete the project files (the project definition) only, to delete the project definition and any data files that may exist for that project, or to cancel the delete operation. Clicking either of the delete options will proceed with the deletion, without further confirmation, and will also delete all of the batch job entries in the computer schedule.

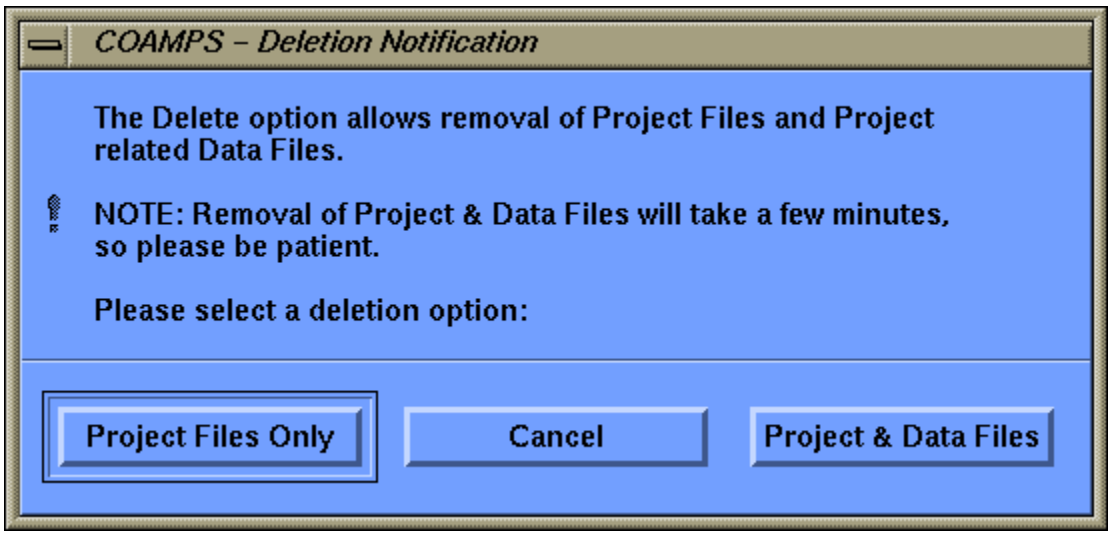
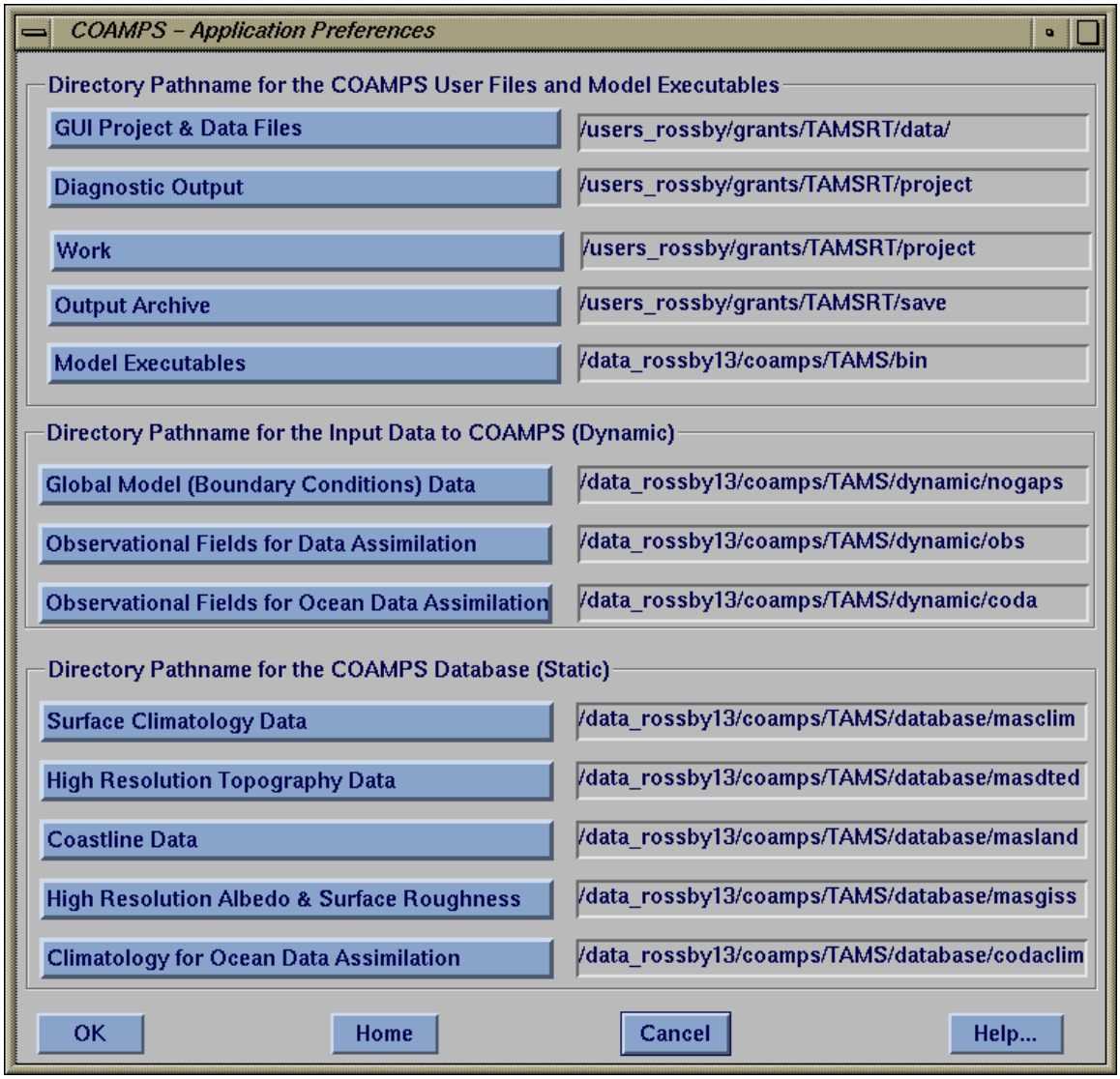


Figure 36. COAMPS Deletion Notification Dialog

HOW DO I SET APPLICATION PREFERENCES?

You can define some options for TAMS/RT by clicking on the **Application Preferences** button on the Main Control Panel. This opens the Application Preferences Control Panel shown below. This control panel allows you to set directory names for the directories used by TAMS/RTand COAMPS To change any selection, just click on the button and select a new directory from the file selection box or click within the field and enter a new directory. NRL developers have already setup the correct paths for the "tams" and "guest-1" and "guest-2" accounts. If you set the GUI up for another user, it is best to follow the "guest-1" or "guest-2" setups for a template.



PART 3 –USING THE TAMS/RT INTERFACE

This section provides more detailed descriptions of the options available in each of the TAMS/RT screens. This overlaps to some extent with the project-oriented discussion of Part 2.

THE TAMS/RT MAIN CONTROL PANEL

The Main Control Panel is the central controller for all COAMPS functions, allowing you to make all inputs and schedule or immediately run COAMPS.

Main Control Panel Features:

- The RED Arrow indicates a control panel has not been edited and the panel does not contain sufficient information to execute properly.

- The GREEN check mark indicates a control panel has been edited or the information has been read. This signal indicates the control panel has the minimal information required to execute properly.

Execution Selections:

- The **Read COAMPS Project** button opens a file selection box, which allows you to select a project file to load into the tool. A file may be selected by either double clicking the left mouse button on the file name or by single clicking the mouse button on the filename and then selecting OK.

- The **Save COAMPS Project** button shows the estimated runtime of the present parameters within all the control panels. You may elect to "Continue with the Save" or "Cancel" to modify parameters for time estimation changes. If "Continue with Save" is selected a file selection box opens, which allows you to select a filename or enter a new filename for saving of the project. A file may be selected by either double clicking the left mouse button on the file name, by single clicking the mouse button on the filename and then selecting OK, or by typing in the filename. All project filenames will be in the form of "ProjectName.proj" the extension will be checked and either modified or added for conformity. You may type in a filename by (1) of two methods; :

  The filename with the "proj" suffix. Ex. Test.proj

  The filename only, e.g. "test"

- The **Delete COAMPS Project** button opens a file selection box, which allows you to select a project file to permanently delete. A file must be selected by single clicking on the file name and selecting the "Delete" button. A message will be displayed allowing deletion options.

- The **Run COAMPS** button opens the Run Control Panel which allows you to begin a COAMPS Model run.

- The **Application Preferences** button opens the Application Preferences Control Panel, which allows you to modify the directory locations of various COAMPS required data locations.

Control Panels:

- The **Map Options...** button opens the Map Projection Control Panel. The symbol to the left of the button indicates whether the information has been input or loaded into the Map Projection Control Panel.

  RED arrow indicates the control panel has not yet been reviewed.

  GREEN check mark indicates the user has reviewed the control panel or all the required data has been input.

- The **Forecast Options...** button opens the Forecast Options Control Panel. The symbol to the left of the button indicates whether the information has been input or loaded into the Forecast Control Panel.

  RED arrow indicates the control panel has not yet been reviewed.

  GREEN check mark indicates the user has reviewed the control panel or all the required data has been input.

- The **Nowcasting Options…** button opens the Nowcasting Control Panel. The symbol to the left of the button indicates whether the information has been input or loaded into the Nowcasting Control Panel.

  RED arrow indicates the control panel has not yet been reviewed.

- GREEN check mark indicates the user has reviewed the control panel or all the required data has been input.

- The **Vertical Grid...** button normally opens the Vertical Grid Control Panel. The symbol to the left of the button indicates whether the information has been input or loaded into the Vertical Grid Control Panel. The vertical grid button has been temporarily disabled. No user input is required in this section.

  RED arrow indicates the control panel has not yet been reviewed.

  GREEN check mark indicates the user has reviewed the control panel or all the required data has been input.

- The **Output Data...** button opens the Output Control Panel. The symbol to the left of the button indicates whether the information has been input or loaded into the Output Data Control Panel.

  RED arrow indicates the control panel has not yet been reviewed.

  GREEN check mark indicates the user has reviewed the control panel or all the required data has been input.

THE MAP OPTIONS CONTROL PANEL

The Map Options Control Panel allows you to specify the map projection parameters and to select and setup the meshes processed by the COAMPS Model. The Map Options file name is specified in the upper left hand corner of the control panel. If no file name is specified, then a project has not yet been read or saved.

The <TAB> key allows you to move through the panel to all fields which require input from the user.

In the Map Projection Control Panel there are several methods of entering data for certain values: Keyboard Input or Mouse Input.

1. KeyBoard Input :

    - All keyboard input may be entered by clicking the left mouse button in the text field of interest and typing in the value.

    - A <RETURN> key in the text field or an APPLY or OK will check all the values entered for validity.

    - A <RETURN> key will also update the graphic display immediately on values which directly affect the graphical display.

2. Mouse Input : The Mouse Input features are defined as follows:

    - Left Mouse Button sets the Center Position of the Coarse Mesh

    - Middle Mouse Button Translates the Selected Mesh and updates the I and J Coordinate positions in the Map Projection Advanced Features dialog.

    - Right Mouse Button Resizes the Selected Mesh and updates the mesh grid size

    - X and Y Axis number of grid points in the Map Projection Control Panel

A Mesh must be selected for all translating and resizing. The mesh may be selected in the Graphical Section of the Control Panel. Checking is implemented to warn users of all constraints during any mouse procedures.

Map Projection Options:

Following are the types of map projections for setting COAMPS model domains.

- **Mercator**

  The Mercator projection is obtained by projecting outward from the center of the globe to draw the earth's surface onto a cylinder wrapped around the globe. The cylinder may be tangent to the globe at the equator (the usual case; standard latitude=0) or may cut the globe at two "standard latitudes" equally spaced from the equator. Its axis is always parallel to the earth's axis. The Mercator projection is best for COAMPS domains located in the equatorial and tropical regions, because its distortion increases the farther you get from the standard latitudes. It is recommended that the pole-ward extent of the coarse mesh area not exceed 40 degrees latitude. Recommended values for the Standard Latitude 1 are between 25 degrees south and 25 degrees north. Standard Latitude 2 is not needed for this map projection. The COAMPS model domain can span both hemispheres (cross the equator).

- **Lambert Conformal**

  The Lambert Conformal projection is obtained by projecting outward from the center of the earth to draw the earth's surface onto a cone that intersects the surface of the globe at two standard latitudes. The axis of the cone is always parallel to the earth's axis, and its apex is above one of the poles. The Lambert Conformal projection is best for COAMPS domains located in the mid-latitude regions. It is recommended that the pole-ward boundary of the coarse mesh not exceed 64 degrees latitude and the equator-ward boundary not be less than 18 degrees latitude. Recommended values for the Standard Latitudes 1 and 2 are 30.0 and 60.0 degrees. Distortion is relatively low for areas between the standard latitudes. The COAMPS model domain may not cross the equator, so Lambert Conformal can only be used for one hemisphere.

- **Spherical**

  The Spherical projection is obtained by projecting outward from the center of the earth to draw the earth's surface onto a sphere surrounding the globe. Distortion is nil in this projection, but it is more difficult to visualize on a flat surface. Distance between grid points is specified in degrees vice meters. There is no restriction on the location of the COAMPS model domain. Standard Latitudes 1 and 2 are not needed for this projection. Spherical projection is generally suited for output of COAMPS model data that are to be used as inputs for another model or tactical aid.

The **Center Latitude for the Coarse Mesh** specifies the center Latitude of the Coarse Mesh.

- The direction of the center Latitude may be specified by the North/South Button to the right of the position.

- This is a required value.
- Keyboard Input is accepted for the value by typing in the field.
- Mouse Input is accepted for the value by clicking the left mouse button relatively close to the desired position of interest. The mouse feature will automatically update both the Center Latitude and the Center Longitude.

The **Center Longitude for the Coarse Mesh** specifies the center Longitude of the Coarse Mesh

- The direction of the center Longitude may be specified by the East/West Button to the left of the position.
- This is a required value.
- Keyboard Input is accepted for the value by typing in the field.
- Mouse Input is accepted for the value by clicking the left mouse button relatively close to the desired position of interest. The mouse feature will automatically update both the Center Latitude and the Center Longitude.

The **Standard Latitude 1** of the Grid Projection defines the latitude in degrees at which the projection is "true".

- Value is required for all projections.
- Keyboard Input is only accepted for the value by typing in the field.

The **Standard Latitude 2** of the Grid Projection defines the latitude in degrees at which the projection is again "true". In this case, the two dimensional map plane intersects the spherical earth in two places. When only **Standard Latitude 1** is required, then the two dimensional map plane is tangent to the earth at that latitude.

- Value is only required for Lambert Conformal Projection.
- Keyboard Input is only accepted for the value by typing in the field.

Grid Section Options:

The **Number of Grid Points** defines the grid size of each of the selected meshes.

- Values are required for each mesh selected.
- Meshes may be chosen by selecting the Mesh button or by selecting the check box.. Once the number of meshes is selected all relative information for the number of

meshes selected is required. Some information fields will be "grayed" out or inaccessible due to the number of meshes selected.

- Keyboard Input is acceptable for all the Number of Grid Point Fields.
  - A <RETURN> key is recommended for each new typed in value. This key stroke will allow the values to be checked for resolution constraints and parent constraints immediately.
  - Error messages are displayed for all incorrect or unacceptable values.
- Mouse Input is acceptable for all the Number of Grid Point Fields.
  - A mesh must be selected in the Graphical Section and the Right mouse button used within the graphical window to resize the mesh.
  - The values are interactively resolution checked.
  - Error messages are displayed during resizing, if any occur.
  - Grid Point values are updated during the resizing of the selected mesh.

Grid Spacing defines the X-Direction spacing for the number of meshes selected.

- Keyboard Input is only accepted for these values by typing in the selected field.
- A <RETURN> key in the typed field will update all the Grid Spacing values.
- Values are in Kilometers for all projections except Spherical, where the units are in Degrees.
- Only values for the number of meshes selected are available.

Graphical Section Options:

Zoom Buttons allow you to zoom in/out around the defined mesh area. The defined area is specified by the center latitude and center longitude of the inner most mesh.

- **Zoom In** zooms inward on the center latitude/longitude position.
- **Zoom Out** zooms out from the center latitude/ longitude position.
- **Reset** resets the graphical window to the entire view of the world.

Mouse Button Features is just a descriptive layout of the mouse buttons and the associated options for each button. This is merely an information label to aid the user.

Select Mesh to Translate or Resize allows you to select a mesh to translate or resize. You will in be informed to select a mesh if no mesh has been specified for translation or resizing.

Basic Map Features:

Load allows the user to read a Map Projection File.

Advanced Features opens an additional Map Projection window which contains some advanced projection parameters.

OK closes the control panel and checks the values for validity.

Home resets the control panel to the initial default setting.

Cancel closes the window.

Help displays the help file.

THE MAP PROJECTION ADVANCED FEATURES CONTROL PANEL

The Map Projection Advanced Features Control Panel allows you to set some additional map projection parameters. The Map Options file name is specified in the upper left hand corner of the control panel. If no file name is specified than a project has not yet been read or saved.

The <TAB> key allows you to move through the panel to all fields which require input from the user.

Advanced Features Options:

Allow Rotated Grids toggle allows you to rotate all the meshes in a Lambert Conformal projection.

- The value in the Longitude Aligned North-South box defaults to the Longitude of the center of the Coarse Mesh; this default value sets the meshes due North. Any modification of the Coarse Mesh Longitude in the Map Projection Control Panel will automatically reset the Longitude Aligned North-South value.

- All meshes are rotated.

Auto Center Grids allows the user to automatically center the meshes within each other or to offset the meshes.

- You may toggle ON/OFF the Auto Center Grids.

- If the Auto Center Grids is OFF you may offset the selected grid using several methods:

- Keyboard Input is accepted for the value by typing in the field.

- Mouse Input is accepted for the values based upon the mesh Selected for translation from the Map Projection Control Panel. As a mesh is translated the values for I & J are automatically updated.

- Arrow Usage allows the user to move a mesh (1) value at a time. The arrow changes are immediate to the graphical display.

Basic Features:

- **OK** closes the control panel and checks the values for validity.

- **Apply** updates the graphical display with the new specified values in the Advanced Control Panel.

- **Home** resets the control panel to the initial default setting.

- **Help** displays the help file.

THE FORECAST OPTIONS CONTROL PANEL

The Forecast Options Control Panel allows you to specify the forecast parameters which will be processed by the COAMPS Model.

The Forecast Options file name is specified in the upper left hand corner of the control panel. If no file name is specified than a project has not yet been read or saved

The <TAB> key allows the user to move through the panel to all fields which require input from the user.

Forecast Specific Features:

- The **Ending TAU for the Coarse Mesh** specifies the length of the forecast specifically for the Coarse Mesh only.

- The **Ending TAU for the Medium Mesh** specifies the length of the forecast specifically for the Medium Mesh only. This option can be unavailable based upon the number of meshes chosen in the Map Projection Control Panel. The value must be less than or equal to the Coarse Mesh Ending Tau.

- The **Ending TAU for the Fine Mesh** specifies the length of the forecast specifically for the Fine Mesh only. This option can be unavailable based upon the number of meshes chosen in the Map Projection Control Panel. The value must be less than or equal to the Medium Mesh Ending Tau.

- The **Ending TAU for the Inner Mesh** specifies the length of the forecast specifically for the Inner Mesh only. This option can be unavailable based upon the number of meshes chosen in the Map Projection Control Panel. The value must be less than or equal to the Fine Mesh Ending Tau.

- The **Frequency of Sigma Output** specifies the frequency for writing out the COAMPS model internal sigma-z coordinate system fields during the forecast run.

- The **Interval of NOGAPS Boundaries** specifies the frequency for obtaining and writing out coarse mesh boundary tendencies from the NOGAPS fields used for data assimilation. This option has been disabled and no user input is required.

- The **Interval of Data Assimilation** specifies the frequency of a data assimilation cycle. This is the interval used for reading and writing of the input and output fields for data assimilation. This value should be equivalent to how often the COAMPS simulation (forecast run) is performed. This option has been disabled and no user input is required.

- The **Update Cycle** allows the user to specify what type of "first guess" fields are used in each update cycle. There are three (3) options:

- **Cold Start (Use NOGAPS Pressure Level Fields) –** A NOGAPS analysis or forecast on pressure levels is used as the first guess.

- **Use COAMPS Pressure Level Fields –** A forecast on pressure levels from a previous COAMPS run is used as the first guess.

- **Use COAMPS Sigma Level Fields (the default) –** An incremental update is completed using analyzed COAMPS fields on pressure surfaces with the Multivariate Optimum Interpolation (MVOI) increments interpolated to sigma-z levels for initialization.

- The **Analysis of Coarse Mesh** is the flag for running Multivariate Optimum Interpolation (MVOI) analysis.

  - **TRUE –** Perform MVOI; generate increments from the observational data and first-guess fields.

  - **FALSE –** Do not perform MVOI; interpolate background fields to the COAMPS meshes.

- The **Analysis of Inner Mesh** is the flag for performing MVOI analysis for the inner meshes.

  - **TRUE** – Perform MVOI on inner mesh fields.

  - **FALSE –** Do not perform MVOI; interpolate coarse mesh increments to the inner mesh fields.

Basic Features:

- **Load** allows you to read a Forecast File.

- **OK** closes the control panel and checks the values for validity.

- **Home** resets the control panel to the initial default setting.

- **Cancel** closes the window.

- **Help** displays the help file.

THE NOWCAST OPTIONS CONTROL PANEL

The Nowcast Options Control Panel allows a user to generate the nowcasting data fields associated with an executing COAMPS model run. The Nowcast Control Panel allows you to select the option to execute nowcasting and to set the time intervals of interest.

HINT: Nowcasting will only be executed on a project which is presently running as a batch job. Please review the message displayed in the control panel in RED for details and instructions about the presently selected project file.

The <TAB> key allows you to move through the panel to all fields which require input from the user.

Nowcast Specific Features:

- The **Run Nowcast** specifies the option to execute nowcasting - Yes/No.
- The **Start Time** specifies the time to begin processing of nowcasting.
- The **End Time** specifies the time to stop processing of nowcasting.
- The **Interval** specifies the frequency for obtaining and writing out the nowcasting information associated with the processing batch job.
- **How many minutes after real time should nowcast start** specifies the actual time for the nowcasting job will begin. The delay in processing will allow all the output files from COAMPS to be generated. The recommendation is a value of 40 minutes.

Basic Features:

- **OK** closes the control panel and checks the values for validity.
- **Home** resets the control panel to the initial default setting.
- **Cancel** closes the window.
- **Help** displays the help file.

THE VERTICAL GRID CONTROL PANEL

The "Vertical Grid" Control panel has been temporarily disabled. All COAMPS jobs will use the default 30 level vertical coordinate system and no user input is required.

The Vertical Grid Control Panel allows you to set and view the Vertical Grid Layers which will be processed by the COAMPS Model.

The Vertical Grid Control Panel file name is specified in the upper left hand corner of the control panel. If no file name is specified than a project has not yet been read or saved. If no project name is present than all values in the control panel are initialization values.

The <TAB> key allows you to move through the panel to all fields which require input from the user.

Vertical Grid Specific Features:

- There are three (3) methods to define the Vertical Grid Layers:
  - **20 Predefined Vertical Grid Layers** - NOT EDITABLE
  - **30 Predefined Vertical Grid Layers** - NOT EDITABLE
  - **User Defined Values** - EDITABLE
    - The User Defined Option allows the user to edit the predefined values or to type in a new set of values. The "Edit" button, which appears for this option, allows the user to select either set of values for editing of the Vertical Grid Layers.
    - Notice each line contains a line number and a Vertical Grid Layer value. The line number is not required to be sequential for correctness. The line number is just to make it easier for you to edit the layers. If a new layer is to be added between (2) values a <RETURN> is required at the end of the previous line. The line number and layer value can then be entered. The spacing user input value is irrelevant as long as (2) items are present on each line.
- **Display** allows you to visually see the Vertical Grid Layers defined. The "**Apply**" button must be clicked in order to update the display after any Vertical Grid Layer changes.

Basic Vertical Grid Features:

- **Load** allows the user to read a Vertical Grid Layer File.
- **OK** closes the control panel and checks the values for validity.

- **Apply** checks the values for validity and updates the Vertical Grid Layer display, if the display window is open.
- **Home** resets the control panel to the initial default setting.
- **Cancel** closes the window.
- **Help** displays the help file.

THE OUTPUT CONTROL PANEL

The Output Control Panel allows you to select the output of the COAMPS Model. You may select any combination of parameters and times for each selected Mesh. You are allowed (4) different combinations of selections per each Level and each Mesh. You may select any number of items per parameter type and mesh type; there are no limitations. The selected items will be the only output from the COAMPS model run, so please check selections carefully by viewing the Selected Output via **Review Selections**.

The Output Options file name is specified in the upper left hand corner of the control panel. If no file name is specified than a project has not yet been read or saved.

The <TAB> key allows you to move through the panel to all fields which require input from the user.

Output Specific Features:

- The **Output Parameters** selection button allows you to select between Pressure Level Parameters, Height Surface Parameters, and Surface Parameters.

- The **Mesh Type** selection button allows you to select the Mesh: Coarse, Medium, Fine, and Inner.

- The **Selection Number** allows you to have (4) different combinations of parameters and times for each Output Parameters and Mesh Type selection.

- The **Beginning Time** indicates the time to begin outputting the selected parameters. The values are input as Hours and Minutes for each combination selection.

- The **Ending Time** indicates the time to stop outputting the selected parameters. The values are input as Hours and Minutes for each combination selection.

- The **Time Interval** indicates how often to output the selected parameters. The values are input as Hours and Minutes for each combination selection. The arrow buttons allow you to increase or decrease the time interval by an amount which is an acceptable output interval based upon the selected data area.

- The **Parameters** list box allows you to select a set of parameters. Click on each parameter desired in the output to select it. You can click a selected parameter again to deselect it.

- The **Levels** list box allows you to select the level(s) for which the set of selected parameters will be output. Click on each level desired in the output to select it. You can deselect a selected level by clicking on it again.

- **Review Selections** allows you to review the output selected in the format of the COAMPS model input file. If the output selections are modified and the Selected Output window is open, the **Review Selections** button must be re-initiated for the output window to update. The output window can be closed by the **OK** button.

Basic Output Features:

- **Load** allows the user to read a Output File.
- **OK** closes the control panel and checks the values for validity.
- **Home** resets the control panel to the initial default setting.
- **Cancel** closes the window.
- **Help** displays the help file.

THE FILE SELECTION CONTROL PANEL

The File Selection Control Panel allows a user to either read, delete, or save a project file. The project files available are listed in the Project list box. These files are located in the specified directory. You are not allowed to change directories to look for a particular project file. To modify the present project directory location, please refer to either the Application Preferences Help file or the TAMSTool.csh file in the /h/TOOLS/bin directory.

The File Selection Control Panel allows you one of the following options, depending on which option was used to open the File Selection Control Panel:

1. Read a Project File and load all the project information into the control panels.

2. Delete a Project file permanently.

3. Save a Project file containing all the information presently in the control panels.

File Selection Specific Options:

- **Read COAMPS Project** allows you to load a project file into the control panels for review or model execution.

    - A project may be selected by double clicking on the project file name.

    - A project may be selected by single clicking on the project filename and selecting OK.

- **Delete COAMPS Project** allows you to delete a selected project.

    - A project may be selected by double clicking on the project file name.

    - A project may be selected by single clicking on the project filename and selecting OK.

    - There are two (2) deletion options: Project Files Only or Project & Data Files.

- **Save COAMPS Project** button shows the estimated runtime of the present parameters within all the control panels. You have an option to "Continue with the Save" or "Cancel" to modify parameters for time estimation changes. If "Continue with Save" is selected a file selection box opens, which allows you to select a filename or enter a new filename for saving of the project. A file may be selected by either double clicking the left mouse button on the file name, by single clicking the mouse button on the filename and then selecting OK, or by typing in the filename. All project filenames will be in the form of "projectName.proj". The extension will be

checked and either modified or added for conformity. You may type in a filename by one of two methods; :

- The filename with the "proj" suffix. Ex. Test.proj
- The filename only "test"

Basic File Selection Control Panel Features:

- **OK** closes the control panel and either opens, saves, or deletes a project file.
- **Cancel** closes the window and takes no action.
- **Delete** permanently removes the project file from the disk.
- **Help** displays this help file.

THE APPLICATION PREFERENCES CONTROL PANEL

The Application Preferences Control Panel allows you to redefine all of the applicable directories which are required by the COAMPS Model. There are two methods for modifying the selections: Interactive and Initialization. The Initialization must be completed correctly for the COAMPS Tool to launch correctly.

The Interactive Method allows you to specify directories in the Application Control Panel by typing in the directory or by selecting the directory from a file selection box.

- Typing Method: Type in the directory path in the text field. The path name specified must be a created directory.

- Selection Method: You are allowed to review the present directory structure. You may select this option by selecting the light blue directory specific button. The button opens a file selection box for the user to traverse the directory tree. To select a directory you may either double click with the left mouse button on the chosen directory in the right directory list or single click with the left mouse button and then click **OK**. Once the file selection box is open you may also traverse the tree for other specified directories by selecting a different directory using the Data Selection menu button. The menu button may be selected by using the left mouse button.

The Initialization Method allows the user to modify the default directory locations. The defaults are always loaded upon launching of the tool. The default directories present in the panel are initially defined in the TAMSTool.csh file. This method of changing the default directories allows a user to customize the COAMPS tool. The following Environment Variables must be modified in the TAMSTool.csh, any combination of changes may be initiated by the user for the following variables:

User Files and Model	**Executables Environment Variable**
GUI Project & Data Files	TAMS_GUIDATA_DIR
Diagnostic Output	TAMS_RUNTIME2_DIR
Work	TAMS_RUNTIME_DIR
Output Archive	TAMS_OUTPUT_DIR
Model Executables	TAMS_BIN_DIR

Input Data to COAMPS (Dynamic)	**Environment Variable**
Global Model Boundary Conditions) Data	TAMS_GLOBALMOD_DIR
Observational Fields for Data Assimilation	TAMS_OBS_DIR

Observational Fields-Ocean Data Assimilation..... TAMS_OCEAN_OBS_DIR

COAMPS Database (Static)	**Environment Variable**
Surface Climatology Directory.....	TAMS_CLIME_DIR
High Resolution Topography Data	TAMS_TOPO_DIR
Coastline Data.....	TAMS_COAST_DIR
High Resolution Albedo & Surface Roughness	TAMS_HIGHRES_DIR
Climatology for Ocean Data Assimilation	TAMS_OCEAN_CLIM_DIR

THE RUN SETUP CONTROL PANEL

The Run Setup Control Panel allows you to set up a COAMPS Model run. You may set up a run to begin at the present time or set up a batch job to be executed.

The Project file name is specified in the upper left hand corner of the control panel. If no file name is specified than a project has not yet been read or saved. If no project name is present than all values in the control panel are initialization values. A file name must be present for you to set up and actually begin a model run.

Run Setup Specific Features:

- The **Run Mode** selector button providesfour options for the type of model run to be performed:

    1. Generate COAMPS NameList Only
    2. Execute COAMPS Analysis
    3. Execute COAMPS Forecast
    4. Execute COAMPS Analysis & Forecast

- The **COAMPS Start – Stop Time** must be specified so the model will have a data set to start with . You should select an available data set from the displayed list.. The start time will be set as the stop time. The selection of the current date time group, ***current-dtg***, will allow the model to use the latest data available when the actual COAMPS Model execution begins; this is the preferred option.

- The **Run COAMPS** button will start a COAMPS model run at the present time. You will be prompted to verify that a model run is the intended action and a run time estimate for the chosen project will be displayed.

- The **Setup Batch Job** button will allow you to setup the model run to be placed on the cron. This allows you to specify multiply model runs and the capability to execute the model at future times. When you click on this button, the Batch Setup Control Panel (discussed in the next section) will appear.

Hints:

- You are not allowed to select more than one individual Start- Stop time for processing.

Basic Run Setup Control Panel Features:.

- **OK** closes the control panel and checks the values for validity.
- **Home** resets the control panel to the initial default setting.
- **Cancel** closes the window.
- **Help** displays this help file.

THE BATCH SETUP CONTROL PANEL

This control panel allows you to select a COAMPS project to be run as a batch job. The left-hand list box shows the currently scheduled batch jobs; the right-hand list box shows the projects available for scheduling. Between the list boxes are three buttons:

- **Add Batch Job** adds the project selected in the right-hand list box to the batch job list in the left-hand list box and opens the Add New Batch Job Control Panel, discussed in the next section. If you click the **Add Batch Job** button with no project selected, an error message will appear.
- **Edit Batch Job** opens the batch job currently selected in the left-hand list box for editing so that you can change the batch times and other parameters. If you click the **Edit Batch Job** button with no batch job selected, an error message will appear.
- **Delete Batch Job** deletes the batch job currently selected in the left-hand list box. If you click the **Delete Batch Job** button with no batch job selected, an error message will appear.

The **OK** button accepts the current selections and proceeds. The **Cancel** button closes the Batch Setup Control Panel without changing anything. The **Help** button displays help.

THE ADD NEW BATCH JOB CONTROL PANEL

The Add New Batch Job Control Panel is used to set the start times for batch runs of the COAMPS model. The text box at the top displays the selections you have made, but does not accept any text inputs Schedule a batch job by setting the start time(s) desired using the **Start Time** counter and the **Hours** and **Minutes** selectors. The Hours and Minutes indicate the time (in Coordinated Universal Time or Greenwich Mean Time) at which a model run will start. Remember to increment the **Start Time** counter for each new selection (otherwise you'll just keep overwriting the time for Start Time 1 with a new value).

The **OK** button accepts the current selections and proceeds. The **Cancel** button closes the Batch Setup Control Panel without changing anything. The **Home** button restores the default batch job scheduling options. The **Help** button displays help.

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PART 4 THE TAMS/RT DEVELOPMENT ENVIRONMENT

Configuration:

a) Silicon Graphics Inc. (SGI) Origin 2000 with 4-processors (250 MHz), 512 MB memory, 36 GB disk, IRIX 6.4 (UNIX) operating system. Requires 30 amp 208V single phase service with NEMA L6-30R twist lock receptacle.

b) SGI O2 graphics console running a web server/browser and GUI interface, IRIX 6.4. Requires two 15 amp 110V NEMA 5-15R receptacles (computer and monitor).

c) HP C200 workstation running the TEDS data base and Informix commercial RDBMS, HP-UX 10.20 (UNIX) operating system. Requires one 15 amp 110V NEMA 5-15R receptacle.

d) American Power Conversion (APC) Matrix 5000 UPS. Requires 30 amp 208V 50 Hz single phase service with NEMA L6-30R twist lock receptacle. All TAMS/RT equipment plugs into UPS.

Configuration Development Environment for TAMS/RT

The configuration of TAMS/RT on the SGI system consists of a 9 GB system disk for the standard operating system and vendor software and two separate file system, approximately 4 GB and 21 GB each. The first file system is primarily reserved for the developers (COAMPS, TEDS, GUI, and visualization) and the second for the operational run of the COAMPS model. The directory structure and user accounts are set-up in accordance to the DISA Defense Information Infrastructure/Common Operating Environment (DII/COE). In areas where the COE is not applicable, common sense and good software engineering practice (modularity, separation of data and executable codes, and consistent naming convention) apply.

Developer Configuration

1. Developer accounts are identified by the particular component in the TAMS/RT system. Currently we have the following accounts: coamps, teds, web, gui. The home directories for the developer accounts are in /u/USERS/{coamps, teds, webvis, gui}

2. Commonly shared development and testing software installed on the TAMS/RT system are:

a. SGI compiler and development software (in /usr/sbin):

1. C/C++

2. FORTRAN

3. Java runtime environment and development kit

4. Http Server

b. Visualization and scripting tools:

1. /h/TOOLS/bin/perl, ….

2. /h/TOOLS/bin/grads, gribscan, gxtran, gxps, … etc

3. /h/TOOLS/bin/vis5d,….

4. /h/TOOLS/GrADS/{map files, font files, … etc}

5. /h/TOOLS/Vis5D/{map files, sample data set}

To use these tools, one must set the shell variable to the path = { $path $TOOLS/bin }.

Operational Configuration

1. Under DII/COE the operational software packages are located under the top level root directory /h. For the TAMS/RT software segment:

/h/TAMS/bin/{coamps_forecast.exe, coamps_analysis.exe, … etc)

/h/TAMS/data{masdted, ocn_clim, dsclim, dsdted, dsland, dsgiss}

2. Dynamic data (NOGAPS fields, SST observations, ADP files, COAMPS output data) generated during run time are placed in the following directories:

NOGAPS fields from TEDS or FNMOC:

/h/data/local/TAMS/nogaps/

Observational data directories (in ADP format) for MVOI:

/h/data/local/TAMS/obs/{adp$dtg}

Observational data directories for the COAMPS Ocean Data Assimilation (CODA):

/h/data/local/TAMS/coda/{mcsst, ship, ssmi, profile, altim, … etc}

Save directories for the COAMPS output:

/h/data/local/TAMS/output/{project_A}/{$dtg_1, $dtg_2, … etc}

/{project_B}/{$dtg_1, $dtg_2, … etc}

.

.

.

The runtime directory where the log files from COAMPS scripts and executables, and namelist parameters file are saved:

/h/data/local/TAMS/rd/{project_name_A}/log

Runtime directory:

/h/data/local/TAMS /{project_name_B}/{run, log}

.

.

.

3. Operational user account are located under /h/USERS/local/{operator1, operator2, …} and /h/USERS/global/{operator4, operator5, …), where local for user account on this machine, global for LAN account. For the TAMS/RT segment, the home directory is /h/USERS/tams.

4. Web directory structure

All data for a particular user and project will be found in the user's home directory under ipvs.

So for the tams user, you will find the project info in:

/u/USERS/tams/ipvs

Within this directory you will find the subdirectories

Configs/PROJ_NAME

Data/PROJ_NAME

Log

Html files for a particular user and project will be found in:

/users/webvis/vis/html/USER_NAME/PROJ_NAME

When a new project area is detected, directories for the new project are created in:

/u/USERS/tams/ipvs

/users/webvis/vis/html

When a project is no longer being run, the following directories and their sub-directories can be deleted:

/u/USERS/tams/ipvs/Configs/PROJ_NAME

/u/USERS/tams/ipvs/Data/PROJ_NAME

/users/webvis/vis/html/tams/PROJ_NAME

For customization, there are two files that the user will want to modify:

/u/USERS/tams/ipvs/Configs/PROJ_NAME/user_settings

/u/USERS/tams/ipvs/Configs/contlist

- The "conlist" file is used to generate an html page that lists available PROJ_NAME plots. When a new project is created, it is automatically added to this list. The user must edit this file to remove a project that is no longer being run.
- The "user_settings" file provides the user with some customization capability. A default "user_settings" file is created when a new project is created.

There are three sections in the "user_settings" file:

1) The first section controls the number of taus and tau interval.

The default is 0 to 24 at 6 hr interval.

The user may change the values for: BEGTAU,NTAU, & INTERVAL

2) The second section sets the plot bounds.

It defaults to the max and min bounds as set by the model.

To crop the plot, he user may change the values for:

MINLON, MAXLON, MINLAT, MAXLAT

Note: If a grid change by the model is detected,

these values will be reset to the new model grid values.

3) The third section is used to specify what plots to create

The commented section is a list of all plots that are available.

Do not modify this section.

Below that section is a list of the plots that will be plotted.

The plot line has three parts:

Name	Html table label	Grids
zrh850	'RH/Heights/Winds at 850mb'	1 2 3

- To remove a plot completely, the user should delete the entire line.
- To limit a particular plot to only certain grids:

delete grid numbers from the "Grids" portion of the line

NOTE: When modifying the "user_settings" file, do not change the format of the file or make any changes other than as described above.

To do plots manually:

As user tams type >

/h/WEBVIS/vis/IPVS/bin/run_ipvs.prl -area AREA_2 -offset 1998071412 –type gp -i /h/WEBVIS/vis/IPVS

where:

-area - PROJ_NAME

-offset - DTG to plot

-type - gp is currently the only choice

-i - directory containing IPVS executables

COAMPS Run Script Variables

Users need to use the GUI to modify the portion of the COAMPS run script that relates to where the COAMPS database and executable files reside on the system.

modDir: directory path under which coamps source code is compiled

runDir: directory path where the run time print out is saved

binDir: directory path where the coamps executable files are located

dataDir: directory path where the model output is saved

climdir: directory path where the climate data is located

nogapsdir: directory path of NOGAPS flat files.

adpdir: directory path of ADP files

gissdir: directory path of GADDAR high resolution albedo and z0 data

dteddir: directory path of 1 km terrain data

osname: the machine name (cray, sgi, hp, or alpha)

codaDir: directory path of CODA climatology sst

sstDir: directory path of observed SST data

The COAMPS run script always assumes the executables are named "coamps_analysis.exe" and "coamps_forecast.exe".

The length of the forecast is set by namelist variable "ktauf". The GUI can be used to change this according to operational requirement. To manually run the COAMPS analysis and forecast, perform the following command:

```
nohup coamps.runscript 1996070100 3 &
```

where 1996070100 should be replaced by the current date-time-group (DTG).

To run COAMPS in data assimilation mode and perform a 24 hr forecast, change the namelist variables:

```
ktauf =    24,  0,  0,
           24,  0,  0,
           24,  0,  0,
iupd  =    2,
```

in the run script and do the following command

nohup coamps.runscript 1996070100 3 1996070112 12 &.

To run COAMPS on multiple threads in the SGI environment, add the following commands in the COAMPS run script.

MP_SET_NUMTHREADS=2

export MP_SET_NUMTHREADS.

NOGAPS Boundary Condition Fields Required by COAMPS

1. First Guess Field for Cold Start/Data Assimilation

tau 12

Surface parameters:

gwet	ground wetness *
slpr	sea-level pressure *
ttgg	ground-sea temperature *
tsea	OTIS sea surface temp
snwp	snow depth field *
u10m	10m u-momentum *
v10m	10m v-momentum *
hfls	sensible heat flux **
hfll	latent heat flux **
strs	wind stress **
blht	boundary layer depth **
z0z0	surface roughness **

Pressure level parameters:

u	u-momentum	(16 pr levels) *
v	v-momentum	(16 pr levels) *
t	air temperature	(16 pr levels) *
dval	geopotential heights	(16 pr levels) *
vapr	vapor pressure	(7 pr levels: 300, 400, 500, 700, 850, 925, 1000) *
dptd	dew-pt depression	(16 pr levels) *

CODA:

mcsst

profiles

ship

ssmi

2. Boundary conditions for prognostics fields

tau 24 --- tau 48 at 12 hrs interval

Surface parameters:

slpr	sea-level pressure
u10m	10m u-momentum (new)
v10m	10m v-momentum (new)

Pressure level parameters:

u	u-momentum	(16 pr levels) *
v	v-momentum	(16 pr levels) *
t	air temperature	(16 pr levels) *
dval	geopotential heights	(16 pr levels) *

vapr	vapor pressure	(7 pr levels: 300, 400, 500, 700, 850, 925, 1000) *
dptd	dew-pt depression	(16 pr levels) *

* Field initialized from NOGAPS during cold start, and from COAMPS history files in subsequent runs.

** Field initialized from COAMPS climatology (or set to 0) during cold start, and from COAMPS history files in subsequent runs.

***16 pressure levels are: 10, 20, 30, 50, 70, 100, 150, 200, 250, 300, 400, 500, 700, 850, 925, 1000

1. Ice coverage - this is the 1 deg NOGAPS ice coverage. COAMPS does not use it right now because it is too coarse. Instead, COAMPS uses the ice coverage data from SSMI that is part of the CODA package.

2. Surface vapor and dew point data are not currently used. These fields will be used in the near future for the surface moisture analysis.

3. COAMPS Ocean Data Assimilation - CODA will use the tsea field from the previous COAMPS model run as the first guess field for the ocean data assimilation. If the previous tsea field is not found and no observational data (mcsst, profile, ssmi, or ship) are available, then CODA generates a tsea field from SST climatology and sets a flag to indicate that climatology has been used. COAMPS checks this flag and if it is not climatology then COAMPS uses the CODA tsea field. If the climatology flag is set, COAMPS looks for the NOGAPS tsea field. If NOGAPS tsea field is found then the NOGAPS tsea field replaces the CODA climatological SST field. Otherwise, the CODA climatological tsea field is used by COAMPS.

The order of precedence is then:

1. CODA (tsea) + observations
2. NOGAPS (tsea)
3. SST Climatology

Estimated disk space required:

Tau = 0, 3, 6, 9, 12, 15, 18, 21, and 24

Triple nest (49X43, 61X61, 70X70, and 30 levels)

Sigma levels parameters:

khkh, kmkm, perp, pott, pppp, qccc, qiii, qsss, tkee, uuuu, vvvv, wvap, wwww

Nest 1: 32 MB

Nest 2: 57 MB

Nest 3: 74 MB

Total 163 MB for a 24 hr forecast saving every 3 hrs; 887 MB for a 48 hr forecast saving every hour.

TAMS/RT Directory Structure

/users

/users/webvis

/users/webvis/vis

/users/webvis/vis/html

/users/webvis/vis/html/tams

/users/webvis/vis/html/tams/AREA_1

/users/webvis/vis/html/tams/AREA_1/Html

/users/webvis/vis/html/tams/AREA_1/ocard

/users/webvis/vis/html/tams/AREA_2

/users/webvis/vis/html/tams/AREA_2/Html

/users/webvis/vis/html/tams/AREA_2/ocard

/users/webvis/vis/html/icons

/users/webvis/vis/html/icons/All

/users/webvis/vis/cgi-bin

/users/webvis/monitor

/users/webvis/monitor/status_reports

/users/webvis/common

/u

/u/USERS

/u/USERS/tams

/u/USERS/tams/tmp

/u/USERS/tams/v5d

/u/USERS/tams/v5d/data

/u/USERS/tams/v5d/data/v5d

/u/USERS/tams/.web

/u/USERS/tams/ipvs

/u/USERS/tams/ipvs/Log

/u/USERS/tams/ipvs/Data

/u/USERS/tams/ipvs/Data/AREA_1

/u/USERS/tams/ipvs/Data/AREA_2

/u/USERS/tams/ipvs/Configs

/u/USERS/tams/ipvs/Configs/AREA_1

/u/USERS/tams/ipvs/Configs/AREA_2

/u/USERS/tams/ipvs/Configs/OldProjSets

/u/USERS/tams/dumpster

/u/USERS/tams/.netscape

/u/USERS/tams/.netscape/cache

/u/USERS/tams/.webcache

/u/USERS/tams/TAMSRT

/u/USERS/tams/TAMSRT/data

/u/USERS/tams/TAMSRT/data/map

/u/USERS/tams/TAMSRT/data/fore

/u/USERS/tams/TAMSRT/data/vert

/u/USERS/tams/TAMSRT/data/ocard

/u/USERS/tams/TAMSRT/data/project

/u/USERS/tams/TAMSRT/save

/u/USERS/tams/TAMSRT/save/Example_WestCoast

/u/USERS/tams/TAMSRT/guiWork

/u/USERS/tams/TAMSRT/project

/u/USERS/tams/TAMSRT/project/Example_WestCoast

/u/USERS/tams/TAMSRT/project/Example_WestCoast/log

/u/USERS/tams/TAMSRT/project/Example_WestCoast/run

/u/USERS/tams/public_html

/u/USERS/tams/public_html/Miscellaneous

/u/USERS/tams/public_html/Public

/u/USERS/tams/Desktop

/u/USERS/tams/webvis

/u/USERS/teds

/u/USERS/teds/TEST

/u/USERS/teds/TEST/RETRIEVE

/u/USERS/teds/TEST/INGEST

/u/USERS/teds/TEST/COAMPS

/u/USERS/teds/MAGRID

/u/USERS/teds/MAGRID/lib

/u/USERS/teds/MAGRID/include

/u/USERS/teds/mugur

/u/USERS/teds/mugur/GRIB

/u/USERS/teds/mugur/GRIB/inc

/u/USERS/teds/mugur/GRIB/inc/SCCS

/u/USERS/teds/mugur/GRIB/lib

/u/USERS/teds/mugur/GRIB/src

/u/USERS/teds/mugur/GRIB/src/SCCS

/u/USERS/teds/mugur/ENCODER

/u/USERS/teds/mugur/ENCODER/SCCS

/u/USERS/teds/mugur/TOOLS

/u/USERS/teds/mugur/TOOLS/SCCS

/u/USERS/teds/mugur/AUDREY

/u/USERS/teds/mugur/AUDREY/SCCS

/u/USERS/teds/mugur/AUDREY/for_mugur

/u/USERS/teds/mugur/PREPROCESSOR

/u/USERS/teds/mugur/PREPROCESSOR/SCCS

/u/USERS/teds/mugur/OUTPUT_MGR

/u/USERS/teds/mugur/OUTPUT_MGR/SCCS

/u/USERS/teds/mugur/DISTRIBC++

/u/USERS/teds/mugur/DISTRIBC++/SCCS

/u/USERS/teds/mugur/SENDOUT

/u/USERS/teds/mugur/SENDOUT/SCCS

/u/USERS/teds/mugur/SENDOUT/passwd

/u/USERS/teds/mugur/DECODERS

/u/USERS/teds/mugur/DECODERS/SRCLIB

/u/USERS/teds/mugur/DECODERS/SRCLIB/SCCS

/u/USERS/teds/mugur/DECODERS/INCLUDE

/u/USERS/teds/mugur/DECODERS/INCLUDE/SCCS

/u/USERS/teds/mugur/DECODERS/DECODERSTART

/u/USERS/teds/mugur/DECODERS/DECODERSTART/SCCS

/u/USERS/teds/coamps

/u/USERS/teds/coamps/obs

/u/USERS/teds/coamps/obs/CODA

/u/USERS/teds/coamps/obs/CODA/SCCS

/u/USERS/teds/coamps/obs/SCCS

/u/USERS/teds/coamps/SCCS

/u/USERS/teds/coamps/data

/u/USERS/teds/coamps/testdir

/u/USERS/teds/coamps/teds4.1

/u/USERS/teds/coamps/teds4.1/data

/u/USERS/webvis

/u/USERS/webvis/lib

/u/USERS/webvis/vis

/u/USERS/webvis/vis/ftp

/u/USERS/webvis/vis/cgi-bin

/u/USERS/webvis/temp

/u/USERS/webvis/temp/MONITOR

/u/USERS/webvis/temp/MONITOR/lib

/u/USERS/webvis/temp/MONITOR/web

/u/USERS/webvis/temp/MONITOR/web/html

/u/USERS/webvis/temp/MONITOR/web/html/common

/u/USERS/webvis/temp/MONITOR/web/images

/u/USERS/webvis/temp/MONITOR/temp

/u/USERS/webvis/temp/MONITOR/temp/MONITOR

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/lib

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/web

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/web/html

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/web/icons

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/web/images

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/status

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/status/extraction

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/status/coamps

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/status_reports

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/monitor/cgi-bin

/u/USERS/webvis/temp/MONITOR/temp/MONITOR/common

/u/USERS/webvis/temp/MONITOR/status

/u/USERS/webvis/temp/MONITOR/status/coamps_nowcast

/u/USERS/webvis/temp/MONITOR/status/products

/u/USERS/webvis/temp/MONITOR/status/coamps_forecast

/u/USERS/webvis/temp/MONITOR/status_reports

/u/USERS/webvis/temp/MONITOR/cgi-bin

/u/USERS/webvis/temp/MONITOR/cgi-bin/common

/u/USERS/webvis/temp/MONITOR/common

/u/USERS/webvis/.netscape

/u/USERS/webvis/.netscape/cache

/u/USERS/webvis/MONITOR

/u/USERS/webvis/MONITOR/lib

/u/USERS/webvis/MONITOR/web

/u/USERS/webvis/MONITOR/web/html

/u/USERS/webvis/MONITOR/web/html/common

/u/USERS/webvis/MONITOR/web/images

/u/USERS/webvis/MONITOR/temp

/u/USERS/webvis/MONITOR/temp/MONITOR

/u/USERS/webvis/MONITOR/temp/MONITOR/lib

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/web

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/web/html

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/web/icons

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/web/images

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/status

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/status/extraction_status

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/status/coamps_status

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/status_reports

/u/USERS/webvis/MONITOR/temp/MONITOR/monitor/cgi-bin

/u/USERS/webvis/MONITOR/temp/MONITOR/common

/u/USERS/webvis/MONITOR/status

/u/USERS/webvis/MONITOR/status/coamps_nowcast

/u/USERS/webvis/MONITOR/status/products

/u/USERS/webvis/MONITOR/status/coamps_forecast

/u/USERS/webvis/MONITOR/status_reports

/u/USERS/webvis/MONITOR/cgi-bin

/u/USERS/webvis/MONITOR/cgi-bin/common

/u/USERS/webvis/MONITOR/common

/u/USERS/webvis/apache_1.2.5

/u/USERS/webvis/apache_1.2.5/src

/u/USERS/webvis/apache_1.2.5/src/regex

/u/USERS/webvis/apache_1.2.5/src/modules

/u/USERS/webvis/apache_1.2.5/src/modules/proxy

/u/USERS/webvis/apache_1.2.5/src/modules/example

/u/USERS/webvis/apache_1.2.5/src/helpers

/u/USERS/webvis/apache_1.2.5/conf

/u/USERS/webvis/apache_1.2.5/logs

/u/USERS/webvis/apache_1.2.5/support

/u/USERS/webvis/apache_1.2.5/htdocs

/u/USERS/webvis/apache_1.2.5/htdocs/manual

/u/USERS/webvis/apache_1.2.5/htdocs/manual/mod

/u/USERS/webvis/apache_1.2.5/htdocs/manual/misc

/u/USERS/webvis/apache_1.2.5/htdocs/manual/images

/u/USERS/webvis/apache_1.2.5/cgi-bin

/u/USERS/webvis/apache_1.2.5/icons

/u/USERS/webvis/common

/u/USERS/guest-2

/u/USERS/guest-2/dumpster

/u/USERS/guest-2/.netscape

/u/USERS/guest-2/public_html

/u/USERS/guest-2/public_html/Miscellaneous

/u/USERS/guest-2/public_html/Public

/u/USERS/guest-2/Desktop

/u/USERS/guest-1

/u/USERS/guest-1/v5d

/u/USERS/guest-1/.web

/u/USERS/guest-1/dumpster

/u/USERS/guest-1/.netscape

/u/USERS/guest-1/.webcache

/u/USERS/guest-1/TAMSRT

/u/USERS/guest-1/TAMSRT/data

/u/USERS/guest-1/TAMSRT/data/map

/u/USERS/guest-1/TAMSRT/data/fore

/u/USERS/guest-1/TAMSRT/data/vert

/u/USERS/guest-1/TAMSRT/data/ocard

/u/USERS/guest-1/TAMSRT/data/project

/u/USERS/guest-1/TAMSRT/save

/u/USERS/guest-1/TAMSRT/guiWork

/u/USERS/guest-1/TAMSRT/project

/u/USERS/guest-1/public_html

/u/USERS/guest-1/public_html/Miscellaneous

/u/USERS/guest-1/public_html/Public

/u/USERS/guest-1/Desktop

/u/USERS/informix

/h

/h/DM

/h/DM/bin

/h/DM/data

/h/DM/data/OUT

/h/DM/data/OUT/thunder

/h/DM/data/OUT/thunder/req

/h/DM/data/OUT/thunder/tmp

/h/DM/data/OUT/manda.nmm.nrlmry.navy.mil

/h/DM/data/OUT/manda.nmm.nrlmry.navy.mil/req

/h/DM/data/OUT/manda.nmm.nrlmry.navy.mil/tmp

/h/DM/data/grib

/h/DM/data/AREA_2

/h/DM/data/AREA_2/tagged

/h/DM/data/AREA_2/2encode

/h/TAMS

/h/TAMS/bin

/h/TAMS/database

/h/TAMS/database/codaclim

/h/TAMS/database/masclim

/h/TAMS/database/masdted

/h/TAMS/database/masdted/terrain

/h/TAMS/database/masgiss

/h/TAMS/database/masland

/h/TAMS/guibin

/h/TAMS/guibin/data

/h/TAMS/guibin/data/map

/h/TAMS/guibin/data/fore

/h/TAMS/guibin/data/vert

/h/TAMS/guibin/data/ocard

/h/TAMS/guibin/data/project

/h/TAMS/guibin/help

/h/TAMS/guibin/hershey

/h/TAMS/guibin/icons

/h/TAMS/guibin/examples

/h/TAMS/guibin/examples/map

/h/TAMS/guibin/examples/fore

/h/TAMS/guibin/examples/vert

/h/TAMS/guibin/examples/ocard

/h/TAMS/guibin/examples/project

/h/TAMS/guibin/examples/_project

/h/TAMS/._guibin

/h/TAMS/._guibin/data

/h/TAMS/._guibin/data/map

/h/TAMS/._guibin/data/fore

/h/TAMS/._guibin/data/vert

/h/TAMS/._guibin/data/ocard

/h/TAMS/._guibin/data/project

/h/TAMS/._guibin/help

/h/TAMS/._guibin/hershey

/h/TAMS/._guibin/icons

/h/TAMS/._guibin/examples

/h/TAMS/._guibin/examples/map

/h/TAMS/._guibin/examples/fore

```
        /h/TAMS/._guibin/examples/vert
        /h/TAMS/._guibin/examples/ocard
        /h/TAMS/._guibin/examples/project
        /h/TAMS/._guibin/examples/_project
/h/TEDS
  /h/TEDS/bin
    /h/TEDS/bin/tmp
  /h/TEDS/log
  /h/TEDS/Coda
    /h/TEDS/Coda/clim
  /h/TEDS/data
    /h/TEDS/data/OUT
      /h/TEDS/data/OUT/199.211.184.204
        /h/TEDS/data/OUT/199.211.184.204/req
        /h/TEDS/data/OUT/199.211.184.204/tmp
    /h/TEDS/data/grib
    /h/TEDS/data/2encode
/h/data
  /h/data/local
    /h/data/local/TAMS
      /h/data/local/TAMS/obs
        /h/data/local/TAMS/obs/adpDTG_1
        /h/data/local/TAMS/obs/adpDTG_2
      /h/data/local/TAMS/coda
        /h/data/local/TAMS/coda/ship
        /h/data/local/TAMS/coda/ssmi
        /h/data/local/TAMS/coda/mcsst
        /h/data/local/TAMS/coda/profile
```

```
        /h/data/local/TAMS/coda/incoming
      /h/data/local/TAMS/save
        /h/data/local/TAMS/save/AREA_1
          /h/data/local/TAMS/save/AREA_1/DTG_1
          /h/data/local/TAMS/save/AREA_1/DTG_2
        /h/data/local/TAMS/save/AREA_2
          /h/data/local/TAMS/save/AREA_2/DTG_1
          /h/data/local/TAMS/save/AREA_2/DTG_2
      /h/data/local/TAMS/nogaps
      /h/data/local/TAMS/project
        /h/data/local/TAMS/project/AREA_1
          /h/data/local/TAMS/project/AREA_1/log
          /h/data/local/TAMS/project/AREA_1/run
        /h/data/local/TAMS/project/AREA_2
          /h/data/local/TAMS/project/AREA_2/log
          /h/data/local/TAMS/project/AREA_2/run
/h/TOOLS
  /h/TOOLS/bin
  /h/TOOLS/lib
  /h/TOOLS/man
    /h/TOOLS/man/man1
    /h/TOOLS/man/man3
    /h/TOOLS/man/mann
  /h/TOOLS/info
  /h/TOOLS/libexec
  /h/TOOLS/whirlgif
  /h/TOOLS/emacs-20.2
  /h/TOOLS/include
```

/h/TOOLS/Vis5D

/h/TOOLS/Vis5D/src

/h/TOOLS/Vis5D/Mesa

/h/TOOLS/Vis5D/Mesa/src

/h/TOOLS/Vis5D/Mesa/src-glu

/h/TOOLS/Vis5D/Mesa/include

/h/TOOLS/Vis5D/Mesa/include/GL

/h/TOOLS/Vis5D/lui5

/h/TOOLS/Vis5D/util

/h/TOOLS/Vis5D/userfuncs

/h/TOOLS/Vis5D/import

/h/TOOLS/Vis5D/contrib

/h/TOOLS/Vis5D/contrib/grib

/h/TOOLS/Vis5D/contrib/grib/src

/h/TOOLS/Vis5D/contrib/uw-meteor

/h/TOOLS/Vis5D/contrib/hdftovis

/h/TOOLS/Vis5D/contrib/gemvis

/h/TOOLS/Vis5D/contrib/witte

/h/TOOLS/Vis5D/contrib/grads

/h/TOOLS/Vis5D/contrib/SimonBaas

/h/TOOLS/Vis5D/convert

/h/TOOLS/GrADS

/h/TOOLS/GrADS/dat

/h/TOOLS/GrADS/lib

/h/TOOLS/GrADS/udf

/h/WEBVIS

/h/WEBVIS/vis

/h/WEBVIS/vis/IPVS

/h/WEBVIS/vis/IPVS/bin

/h/WEBVIS/vis/IPVS/bin/gp

/h/WEBVIS/vis/IPVS/bin/Utils

/h/WEBVIS/vis/IPVS/bin/Grads

/h/WEBVIS/vis/IPVS/bin/Grads/GrUtils

/h/WEBVIS/vis/IPVS/bin/GenName

/h/WEBVIS/vis/IPVS/bin/ocard

/h/WEBVIS/vis/IPVS/bin/ocard/OcardMonitor

/h/WEBVIS/vis/IPVS/bin/ocard/OcardMonitor/Orig